



FLUOROCARBON

27611 La Paz Road
P.O. Box 6299
Laguna Niguel, California 92656
714/831-5350 • 213/687-8540
TWX: 910-595-2552 FAX: 714/643-1548

July 25, 1989

CONTAINS NO CBI

90-890000567

CERTIFIED MAIL
RETURN RECEIPT
REQUESTED

Document Processing Center
Office of Toxic Substances, TS-790
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

Attention: CAIR Reporting Office

Gentlemen:

Enclosed herewith, please find our Comprehensive Assessment Information Rule Reporting Form for The Fluorocarbon Company's Seattle (Areospace Components) Division. Attached with the CAIR reporting form is the Material Safety Data Sheet and Technical Data as required pursuant to the form.

Very truly yours,

THE FLUOROCARBON COMPANY

Daniel A. Hathaway
Senior Attorney

cc: Steve Fabre

Enclosures

Dedicated To Excellence

CONTAINS NO CBI



Form Approved
OMB No. 2010-0019
Approval Expires 12-31-89

EPA-OTS



000611353J

90-890000567

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Comprehensive Assessment Information Rule
REPORTING FORM

When completed, send this form to:

Document Processing Center
Office of Toxic Substances, TS-790
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
Attention: CAIR Reporting Office

For Agency Use Only:

Date of Receipt: _____

Document
Control Number: _____

Docket Number: _____

SECTION 1 GENERAL MANUFACTURER, IMPORTER, AND PROCESSOR INFORMATION

PART A GENERAL REPORTING INFORMATION

1.01 This Comprehensive Assessment Information Rule (CAIR) Reporting Form has been completed in response to the Federal Register Notice of..... [7][2] [2][2] [8][8]
CBI mo. day year

☐ a. If a Chemical Abstracts Service Number (CAS No.) is provided in the Federal Register, list the CAS No. [0][2][6][4][7][1]-[6][2]-[5]

b. If a chemical substance CAS No. is not provided in the Federal Register, list either (i) the chemical name, (ii) the mixture name, or (iii) the trade name of the chemical substance as provided in the Federal Register.

(i) Chemical name as listed in the rule NA

(ii) Name of mixture as listed in the rule NA

(iii) Trade name as listed in the rule NA

c. If a chemical category is provided in the Federal Register, report the name of the category as listed in the rule, the chemical substance CAS No. you are reporting on which falls under the listed category, and the chemical name of the substance you are reporting on which falls under the listed category.

Name of category as listed in the rule NA

CAS No. of chemical substance [][][][][]-[][]-[][]

Name of chemical substance NA

1.02 Identify your reporting status under CAIR by circling the appropriate response(s).

CBI Manufacturer 1

☐ Importer 2

Processor 3

X/P manufacturer reporting for customer who is a processor 4

X/P processor reporting for customer who is a processor 5

☐ Mark (X) this box if you attach a continuation sheet.

1.03 Does the substance you are reporting on have an "x/p" designation associated with it in the above-listed Federal Register Notice?

CBI

Yes ☒ Go to question 1.04

☐ No ☐ Go to question 1.05

1.04 a. Do you manufacture, import, or process the listed substance and distribute it under a trade name(s) different than that listed in the Federal Register Notice? Circle the appropriate response.

CBI

Yes 1

☐ No 2

b. Check the appropriate box below:

☐ You have chosen to notify your customers of their reporting obligations

Provide the trade name(s)

☐ You have chosen to report for your customers

☐ You have submitted the trade name(s) to EPA one day after the effective date of the rule in the Federal Register Notice under which you are reporting.

1.05 If you buy a trade name product and are reporting because you were notified of your reporting requirements by your trade name supplier, provide that trade name.

CBI

Trade name NA

☐ Is the trade name product a mixture? Circle the appropriate response.

Yes 1

No 2

1.06 Certification -- The person who is responsible for the completion of this form must sign the certification statement below:

CBI

☐ "I hereby certify that, to the best of my knowledge and belief, all information entered on this form is complete and accurate."

PAUL R. LIVESEY
NAME

Paul R. Livesey
SIGNATURE

13 July 1989
DATE SIGNED

General Manager
TITLE

(206) 723 - 5600
TELEPHONE NO.

☐ Mark (X) this box if you attach a continuation sheet.

1.07 Exemptions From Reporting -- If you have provided EPA or another Federal agency with the required information on a CAIR Reporting Form for the listed substance within the past 3 years, and this information is current, accurate, and complete for the time period specified in the rule, then sign the certification below. You CBI ☐ are required to complete section 1 of this CAIR form and provide any information now required but not previously submitted. Provide a copy of any previous submissions along with your Section 1 submission.

"I hereby certify that, to the best of my knowledge and belief, all required information which I have not included in this CAIR Reporting Form has been submitted to EPA within the past 3 years and is current, accurate, and complete for the time period specified in the rule."

_____ NAME	_____ SIGNATURE	_____ DATE SIGNED
_____ TITLE	(_____) _____ TELEPHONE NO.	_____ DATE OF PREVIOUS SUBMISSION

1.08 CBI Certification -- If you have asserted any CBI claims in this report you must certify that the following statements truthfully and accurately apply to all of those confidentiality claims which you have asserted.

CBI ☐ "My company has taken measures to protect the confidentiality of the information, and it will continue to take these measures; the information is not, and has not been, reasonably ascertainable by other persons (other than government bodies) by using legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding) without my company's consent; the information is not publicly available elsewhere; and disclosure of the information would cause substantial harm to my company's competitive position."

_____ NAME	_____ SIGNATURE	_____ DATE SIGNED
_____ TITLE	(_____) _____ TELEPHONE NO.	

☐ Mark (X) this box if you attach a continuation sheet.

PART B CORPORATE DATA

1.09 Facility Identification

CBI Name [F][L][U][O][R][O][C][A][R][B][O][N][][S][E][A][T][T][L][E][][D][I][V.][][]
[] Address [3][7][1][1][][S][][H][U][D][S][O][N][][S][T][][][][][][][][][][][]
Street
[S][E][A][T][T][L][E][][][][][][][][][][][][][][][][][]
City
[W][A][][9][8][1][1][8][]--[][][][]
State Zip
Dun & Bradstreet Number[0][0]-[8][3][8]-[2][9][4][7]
EPA ID Number[0][8][3][3][4][8][1][5][1]
Employer ID Number95.[-][1][9][4][7][1][5][5]
Primary Standard Industrial Classification (SIC) Code[3][0][7][9]
Other SIC Code[][][][]
Other SIC Code[][][][]

1.10 Company Headquarters Identification

CBI Name [F][L][U][O][R][O][C][A][R][B][O][N][][][][][][][][][][][][][]
[] Address [2][7][6][1][1][][L][A][][P][A][Z][][R][O][A][D][][][][][][][][][][]
Street
[L][A][C][U][N][A][][M][I][G][U][E][L][][][][][][][][][][][][][]
City
[C][A][][9][2][6][7][7][]--[][][][]
State Zip
Dun & Bradstreet Number[0][0]-[8][3][8]-[2][9][4][7]
Employer ID Number95.[-][1][9][4][7][1][5][5]

[] Mark (X) this box if you attach a continuation sheet.

1.11 Parent Company Identification

[illegible]

1.12 Technical Contact

CBI Name [S][T][E][V][E][N] [F][A][B][R][E] [][][][][][][][][][][][][][][][]
[][] Title [M][A][T][E][R][I][A][L][S] [R][+][D] [][][][][][][][][][][][][][][][]
Address [3][7][1][1] [S] [H][U][D][S][O][N] [S][T] [][][][][][][][][][][][][][][]
Street
[S][E][A][T][T][L][E] [][][][][][][][][][][][][][][][]
City
[W][A] [9][8][1][1][8]--[][][][][]
State Zip
Telephone Number [2][0][6]-[7][2][3]-[5][6][0][0]

1.13 This reporting year is from [0][2] [8][8] to [0][2] [8][9]
Mo. Year Mo. Year

☐ Mark (X) this box if you attach a continuation sheet.

[illegible]

NA

[illegible]

 --
 State Zip

Employer ID Number() () () () () () () ()

Date of Sale () () () () () ()
Mo. Day Year

[illegible]

Telephone Number()-()-()

[illegible]

NA

[illegible]

 --
 State Zip

Employer ID Number() () () () () () () ()

Date of Purchase () () () () () ()
Mo. Day Year

Contact Person []

Telephone Number()-()-

8

1.16 For each classification listed below, state the quantity of the listed substance that was manufactured, imported, or processed at your facility during the reporting year.

CBI
Classification Quantity (kg/yr)

☐

Manufactured

Imported

Processed (include quantity repackaged) 291

Of that quantity manufactured or imported, report that quantity:

In storage at the beginning of the reporting year

For on-site use or processing

For direct commercial distribution (including export)

In storage at the end of the reporting year

Of that quantity processed, report that quantity:

In storage at the beginning of the reporting year 116

Processed as a reactant (chemical producer) 291

Processed as a formulation component (mixture producer)

Processed as an article component (article producer)

Repackaged (including export)

In storage at the end of the reporting year 38

☐ Mark (X) this box if you attach a continuation sheet.

PART C IDENTIFICATION OF MIXTURES

1.17 Mixture -- If the listed substance on which you are required to report is a mixture or a component of a mixture, provide the following information for each component chemical. (If the mixture composition is variable, report an average percentage of each component chemical for all formulations.)

CBI

()

Component Name	Supplier Name	Average % Composition by Weight (specify precision, e.g., 45% ± 0.5%)
NA		
Total		100%

☐ Mark (X) this box if you attach a continuation sheet.

2.04 State the quantity of the listed substance that your facility manufactured, imported, or processed during the 3 corporate fiscal years preceding the reporting year in descending order.

CBI

☐ Year ending [0][2] [8][7]
Mo. Year

Quantity manufactured kg

Quantity imported kg

Quantity processed 454 kg

Year ending [0][2] [8][6]
Mo. Year

Quantity manufactured kg

Quantity imported kg

Quantity processed 346 kg

Year ending [0][2] [8][5]
Mo. Year

Quantity manufactured kg

Quantity imported kg

Quantity processed 346 kg

2.05 Specify the manner in which you manufactured the listed substance. Circle all appropriate process types.

CBI

☐ Continuous process 1
Semicontinuous process 2
Batch process 3

☐ Mark (X) this box if you attach a continuation sheet.

2.06 Specify the manner in which you processed the listed substance. Circle all appropriate process types.

- ☐ Continuous process 1
- ☐ Semicontinuous process 2
- ☒ Batch process 3

2.07 State your facility's name-plate capacity for manufacturing or processing the listed substance. (If you are a batch manufacturer or batch processor, do not answer this question.)

- ☐ Manufacturing capacity kg/yr
- ☐ Processing capacity UK kg/yr

2.08 If you intend to increase or decrease the quantity of the listed substance manufactured, imported, or processed at any time after your current corporate fiscal year, estimate the increase or decrease based upon the reporting year's production volume.

<input type="checkbox"/>	Manufacturing Quantity (kg)	Importing Quantity (kg)	Processing Quantity (kg)
Amount of increase	<u>NA</u>		
Amount of decrease	<u>NA</u>		

☐ Mark (X) this box if you attach a continuation sheet.

2.09 For the three largest volume manufacturing or processing process types involving the listed substance, specify the number of days you manufactured or processed the listed substance during the reporting year. Also specify the average number of hours per day each process type was operated. (If only one or two operations are involved, list those.)

CBI

☐

Days/Year Average
Hours/Day

Process Type #1 (The process type involving the largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	<u>15</u>	<u>8</u>

Process Type #2 (The process type involving the 2nd largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	_____	_____

Process Type #3 (The process type involving the 3rd largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	_____	_____

2.10 State the maximum daily inventory and average monthly inventory of the listed substance that was stored on-site during the reporting year in the form of a bulk chemical.

CBI

☐

NA

Maximum daily inventory kg

Average monthly inventory kg

☐ Mark (X) this box if you attach a continuation sheet.

- 2.11 Related Product Types -- List any byproducts, coproducts, or impurities present with the listed substance in concentrations greater than 0.1 percent as it is manufactured, imported, or processed. The source of byproducts, coproducts, or impurities means the source from which the byproducts, coproducts, or impurities are made or introduced into the product (e.g., carryover from raw material, reaction product, etc.).

CBI

☐

<u>CAS No.</u>	<u>Chemical Name</u>	<u>Byproduct, Coproduct or Impurity</u> ¹	<u>Concentration (%) (specify \pm % precision)</u>	<u>Source of By-products, Coproducts, or Impurities</u>
	<i>NA</i>			

¹Use the following codes to designate byproduct, coproduct, or impurity:

B = Byproduct
C = Coproduct
I = Impurity

☐ Mark (X) this box if you attach a continuation sheet.

- 2.12 Existing Product Types** -- List all existing product types which you manufactured, imported, or processed using the listed substance during the reporting year. List the quantity of listed substance you use for each product type as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI
☐

a.	b.	c.	d.
Product Types ¹	% of Quantity Manufactured, Imported, or Processed	% of Quantity Used Captively On-Site	Type of End-Users ²
<i>B</i>	<i>100</i>	<i>100</i>	<i>I</i>

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/ Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/ Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

- 2.13 Expected Product Types -- Identify all product types which you expect to manufacture, import, or process using the listed substance at any time after your current corporate fiscal year. For each use, specify the quantity you expect to manufacture, import, or process for each use as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI

☐

a.	b.	c.	d.
Product Types ¹	% of Quantity Manufactured, Imported, or Processed	% of Quantity Used Captively On-Site	Type of End-Users ²
B	100	100	I

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/ Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/ Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

2.14 Final Product -- Complete the following table for each type of final product manufactured, imported, or processed at your facility that contains the listed substance other than as an impurity.

☐

a.	b.	c.	d.
Product Type ¹	Final Product's Physical Form ²	Average % Composition of Listed Substance in Final Product	Type of End-Users ³
<i>NA</i>			

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the final product's physical form:

A = Gas	F2 = Crystalline solid
B = Liquid	F3 = Granules
C = Aqueous solution	F4 = Other solid
D = Paste	G = Gel
E = Slurry	H = Other (specify) _____
F1 = Powder	

³Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

2.15 Circle all applicable modes of transportation used to deliver bulk shipments of the
CBI listed substance to off-site customers.

☐ Truck 1
Railcar 2
Barge, Vessel 3
Pipeline 4
Plane 5
Other (specify) NA 6

2.16 Customer Use -- Estimate the quantity of the listed substance used by your customers
CBI or prepared by your customers during the reporting year for use under each category
of end use listed (i-iv).

☐

Category of End Use

i. Industrial Products

Chemical or mixture NA kg/yr
Article kg/yr

ii. Commercial Products

Chemical or mixture NA kg/yr
Article kg/yr

iii. Consumer Products

Chemical or mixture NA kg/yr
Article kg/yr

iv. Other

Distribution (excluding export) NA kg/yr
Export kg/yr
Quantity of substance consumed as reactant kg/yr
Unknown customer uses kg/yr

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 3 PROCESSOR RAW MATERIAL IDENTIFICATION

PART A GENERAL DATA

- 3.01 Specify the quantity purchased and the average price paid for the listed substance for each major source of supply listed. Product trades are treated as purchases.
CBI The average price is the market value of the product that was traded for the listed substance.

☐

<u>Source of Supply</u>	<u>Quantity (kg)</u>	<u>Average Price (\$/kg)</u>
The listed substance was manufactured on-site.		
The listed substance was transferred from a different company site.		
The listed substance was purchased directly from a manufacturer or importer.	291	\$3.52
The listed substance was purchased from a distributor or repackager.		
The listed substance was purchased from a mixture producer.		

-
- 3.02 Circle all applicable modes of transportation used to deliver the listed substance to your facility.

CBI

☐

Truck	1
Railcar	2
Barge, Vessel	3
Pipeline	4
Plane	5
Other (specify) _____	6

☐ Mark (X) this box if you attach a continuation sheet.

3.03 a. Circle all applicable containers used to transport the listed substance to your facility.

CBI

☐

Bags 1
Boxes 2
Free standing tank cylinders 3
Tank rail cars 4
Hopper cars 5
Tank trucks 6
Hopper trucks 7
Drums 8
Pipeline 9
Other (specify) 5 gal cans 10

b. If the listed substance is transported in pressurized tank cylinders, tank rail cars, or tank trucks, state the pressure of the tanks.

Tank cylinders mmHg
Tank rail cars mmHg
Tank trucks mmHg

☐ Mark (X) this box if you attach a continuation sheet.

PART B RAW MATERIAL IN THE FORM OF A MIXTURE

3.04 If you obtain the listed substance in the form of a mixture, list the trade name(s) of the mixture, the name of its supplier(s) or manufacturer(s), an estimate of the average percent composition by weight of the listed substance in the mixture, and the amount of mixture processed during the reporting year.

CBI

☐

<u>Trade Name</u>	<u>Supplier or Manufacturer</u>	<u>Average % Composition by Weight (specify \pm % precision)</u>	<u>Amount Processed (kg/yr)</u>
<u>NA</u>			

☐ Mark (X) this box if you attach a continuation sheet.

PART C RAW MATERIAL VOLUME

3.05 State the quantity of the listed substance used as a raw material during the reporting year in the form of a class I chemical, class II chemical, or polymer, and the percent composition, by weight, of the listed substance.

☐

	Quantity Used (kg/yr)	% Composition by Weight of Listed Sub- stance in Raw Material (specify \pm % precision)
Class I chemical	<u>291</u>	<u>100</u>
	<u> </u>	<u> </u>
	<u> </u>	<u> </u>
Class II chemical	<u> </u>	<u> </u>
	<u> </u>	<u> </u>
	<u> </u>	<u> </u>
Polymer	<u> </u>	<u> </u>
	<u> </u>	<u> </u>
	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 4 PHYSICAL/CHEMICAL PROPERTIES

General Instructions:

If you are reporting on a mixture as defined in the glossary, reply to questions in Section 4 that are inappropriate to mixtures by stating "NA -- mixture."

For questions 4.06-4.15, if you possess any hazard warning statement, label, MSDS, or other notice that addresses the information requested, you may submit a copy or reasonable facsimile in lieu of answering those questions which it addresses.

PART A PHYSICAL/CHEMICAL DATA SUMMARY

- 4.01 Specify the percent purity for the three major¹ technical grade(s) of the listed substance as it is manufactured, imported, or processed. Measure the purity of the substance in the final product form for manufacturing activities, at the time you import the substance, or at the point you begin to process the substance.

CBI

☐

	<u>Manufacture</u>	<u>Import</u>	<u>Process</u>
Technical grade #1	_____ % purity	_____ % purity	<u>100</u> % purity
Technical grade #2	_____ % purity	_____ % purity	_____ % purity
Technical grade #3	_____ % purity	_____ % purity	_____ % purity

¹Major = Greatest quantity of listed substance manufactured, imported or processed.

- 4.02 Submit your most recently updated Material Safety Data Sheet (MSDS) for the listed substance, and for every formulation containing the listed substance. If you possess an MSDS that you developed and an MSDS developed by a different source, submit your version. Indicate whether at least one MSDS has been submitted by circling the appropriate response.

☒ Yes 1

No 2

Indicate whether the MSDS was developed by your company or by a different source.

Your company 1

Another source 2

☐ Mark (X) this box if you attach a continuation sheet.

4.03 Submit a copy or reasonable facsimile of any hazard information (other than an MSDS) that is provided to your customers/users regarding the listed substance or any formulation containing the listed substance. Indicate whether this information has been submitted by circling the appropriate response.

☒ Yes 1
 No 2

4.04 For each activity that uses the listed substance, circle all the applicable number(s) corresponding to each physical state of the listed substance during the activity listed. Physical states for importing and processing activities are determined at the time you import or begin to process the listed substance. Physical states for manufacturing, storage, disposal and transport activities are determined using the final state of the product.

CBI
☐

Activity	Physical State				
	Solid	Slurry	Liquid	Liquified Gas	Gas
Manufacture	1	2	3	4	5
Import	1	2	3	4	5
Process	1	2	<input checked="" type="radio"/> 3	4	5
Store	1	2	<input checked="" type="radio"/> 3	4	5
Dispose	<input checked="" type="radio"/> 1	2	3	4	5
Transport	1	2	3	4	5

☐ Mark (X) this box if you attach a continuation sheet.

- 4.05 Particle Size -- If the listed substance exists in particulate form during any of the following activities, indicate for each applicable physical state the size and the percentage distribution of the listed substance by activity. Do not include particles ≥ 10 microns in diameter. Measure the physical state and particle sizes for importing and processing activities at the time you import or begin to process the listed substance. Measure the physical state and particle sizes for manufacturing storage, disposal and transport activities using the final state of the product.

CBI

☐

Physical State		Manufacture	Import	Process	Store	Dispose	Transport
Dust	<1 micron						
	1 to <5 microns	NA					
	5 to <10 microns						
Powder	<1 micron						
	1 to <5 microns	NA					
	5 to <10 microns						
Fiber	<1 micron						
	1 to <5 microns	NA					
	5 to <10 microns						
Aerosol	<1 micron						
	1 to <5 microns	NA					
	5 to <10 microns						

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 5 ENVIRONMENTAL FATE

PART A RATE CONSTANTS AND TRANSFORMATION PRODUCTS

5.01 Indicate the rate constants for the following transformation processes.

a. Photolysis:

Absorption spectrum coefficient (peak) (1/M cm) at _____ nm

Reaction quantum yield, ϕ at _____ nm

Direct photolysis rate constant, k_p , at ... _____ 1/hr _____ latitude

b. Oxidation constants at 25°C:

For 1O_2 (singlet oxygen), k_{ox} 1/M hr

For RO_2 (peroxy radical), k_{ox} 1/M hr

c. Five-day biochemical oxygen demand, BOD_5 ... _____ mg/l

d. Biotransformation rate constant:

For bacterial transformation in water, k_b ... _____ 1/hr

Specify culture _____

e. Hydrolysis rate constants:

For base-promoted process, k_b 1/M hr

For acid-promoted process, k_a 1/M hr

For neutral process, k_n 1/hr

f. Chemical reduction rate (specify conditions) _____

g. Other (such as spontaneous degradation) ... _____

See MSDS + Tech sheet

☐ Mark (X) this box if you attach a continuation sheet.

PART B PARTITION COEFFICIENTS

5.02 a. Specify the half-life of the listed substance in the following media.

<u>Media</u>	<u>Half-life (specify units)</u>
Groundwater	<u>NA</u>
Atmosphere	<u>UK</u>
Surface water	<u>NA</u>
Soil	<u>NA</u>

b. Identify the listed substance's known transformation products that have a half-life greater than 24 hours.

<u>CAS No.</u>	<u>Name</u>	<u>Half-life (specify units)</u>	<u>Media</u>
<u>UK</u>			in
			in
			in
			in

5.03 Specify the octanol-water partition coefficient, K_{ow} ... UK at 25°C
 Method of calculation or determination

5.04 Specify the soil-water partition coefficient, K_d UK at 25°C
 Soil type

5.05 Specify the organic carbon-water partition coefficient, K_{oc} UK at 25°C

5.06 Specify the Henry's Law Constant, H UK atm-m³/mole

☐ Mark (X) this box if you attach a continuation sheet.

5.07 List the bioconcentration factor (BCF) of the listed substance, the species for which it was determined, and the type of test used in deriving the BCF.

<u>Bioconcentration Factor</u>	<u>Species</u>	<u>Test</u> ¹
<u>UK</u>		

¹Use the following codes to designate the type of test:

F = Flowthrough
S = Static

See information supplied

☐ Mark (X) this box if you attach a continuation sheet.

6.04 For each market listed below, state the quantity sold and the total sales value of
CBI the listed substance sold or transferred in bulk during the reporting year.

☐

Market	Quantity Sold or Transferred (kg/yr)	Total Sales Value (\$/yr)
<i>NA</i>		
Retail sales		
Distribution -- Wholesalers		
Distribution -- Retailers		
Intra-company transfer		
Repackagers		
Mixture producers		
Article producers		
Other chemical manufacturers or processors		
Exporters		
Other (specify)		

6.05 Substitutes -- List all known commercially feasible substitutes that you know exist
for the listed substance and state the cost of each substitute. A commercially
feasible substitute is one which is economically and technologically feasible to use
CBI in your current operation, and which results in a final product with comparable
performance in its end uses.

☐

Substitute	Cost (\$/kg)
<i>No substitute at this time</i>	

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 7 MANUFACTURING AND PROCESSING INFORMATION

General Instructions:

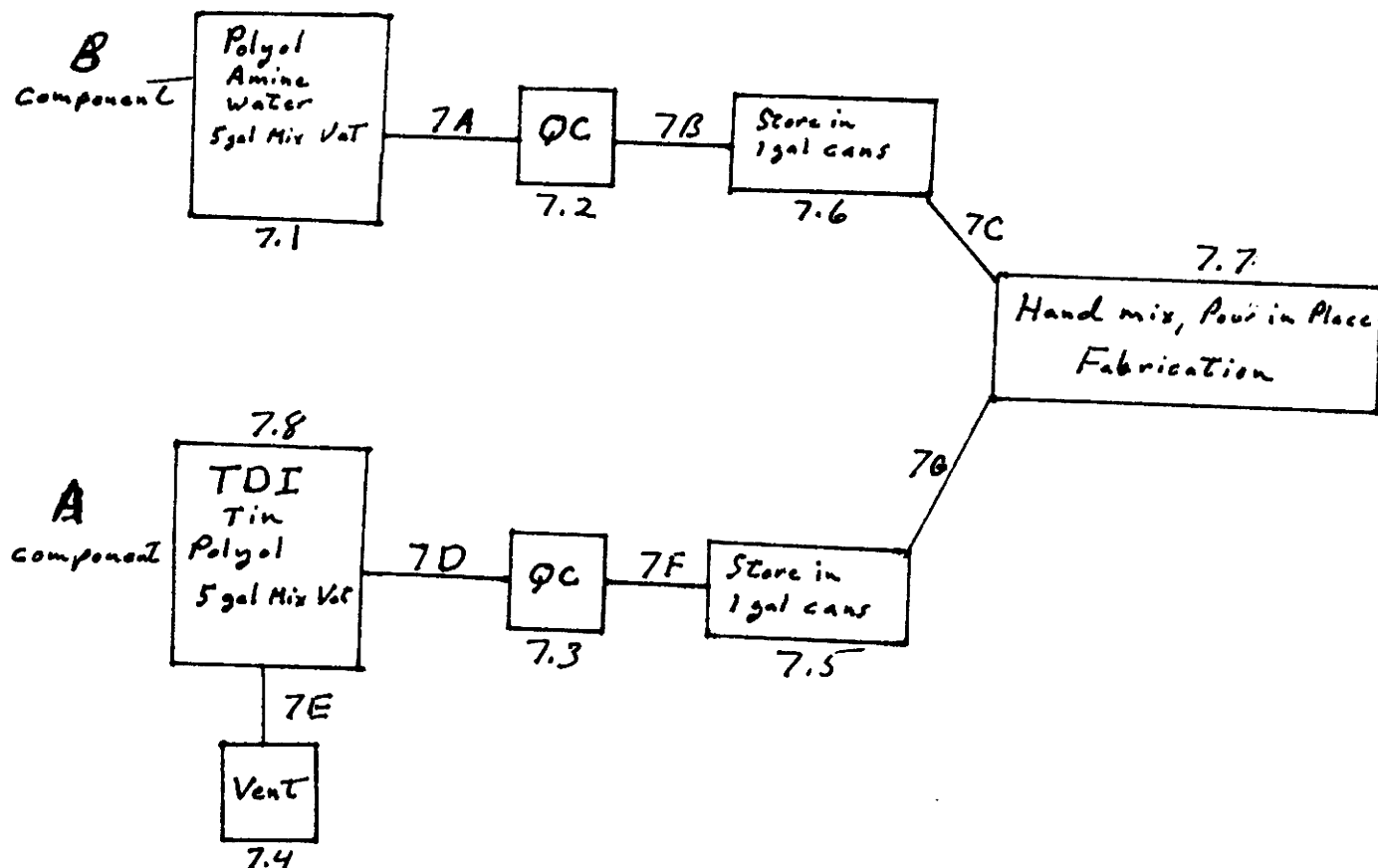
For questions 7.04-7.06, provide a separate response for each process block flow diagram provided in questions 7.01, 7.02, and 7.03. Identify the process type from which the information is extracted.

PART A MANUFACTURING AND PROCESSING PROCESS TYPE DESCRIPTION

7.01 In accordance with the instructions, provide a process block flow diagram showing the major (greatest volume) process type involving the listed substance.

CBI

☐ Process type Prepolymerization / Hand Mix pour in place

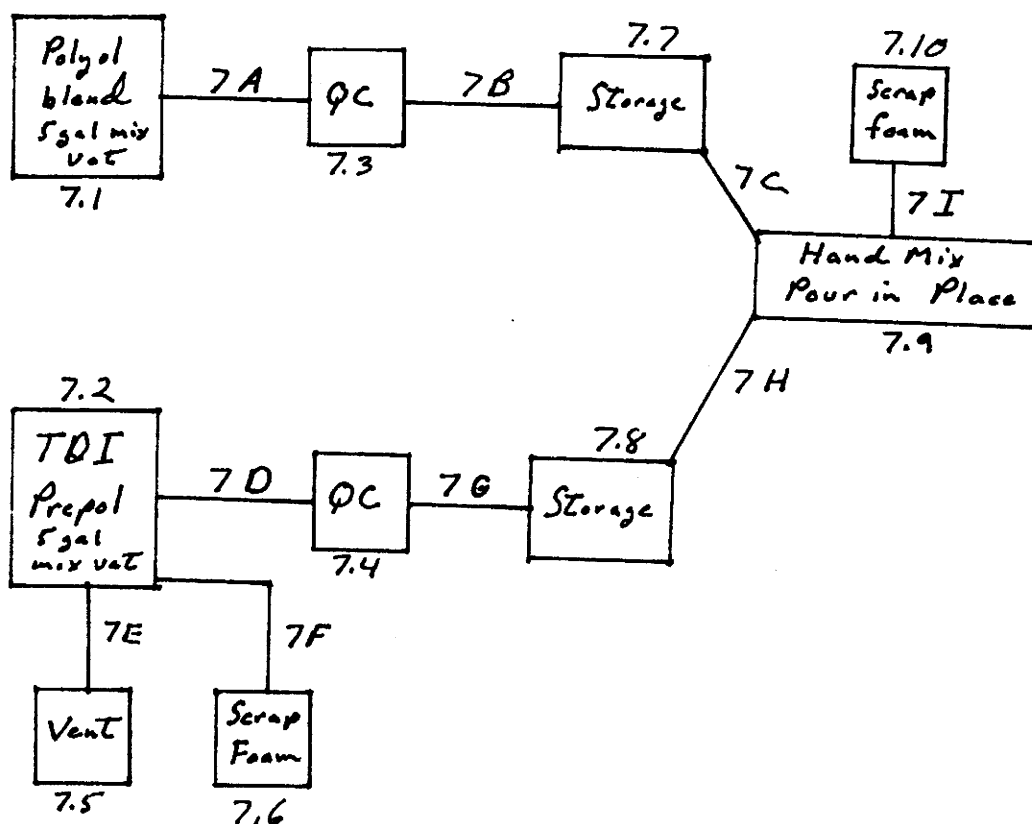


☐ Mark (X) this box if you attach a continuation sheet.

7.03 In accordance with the instructions, provide a process block flow diagram showing all process emission streams and emission points that contain the listed substance and which, if combined, would total at least 90 percent of all facility emissions if not treated before emission into the environment. If all such emissions are released from one process type, provide a process block flow diagram using the instructions for question 7.01. If all such emissions are released from more than one process type, provide a process block flow diagram showing each process type as a separate block.

CBI

☐ Process type Prepolymerization / Hand mix
Pour in Place



☐ Mark (X) this box if you attach a continuation sheet.

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

☐ Process type Prepolymerization / Hand mix Pour in Place

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
<u>7.1</u>	<u>5gal can</u>	<u>20</u>	<u>NA</u>	<u>metal</u>
<u>7.1</u>	<u>Air mixer</u>	<u>20</u>	<u>NA</u>	<u>NA</u>
<u>7.8</u>	<u>5gal can</u>	<u>80</u>	<u>NA</u>	<u>metal</u>
<u>7.8</u>	<u>Air mixer</u>	<u>20</u>	<u>NA</u>	<u>NA</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

☐ Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

☐ Process type Prepolymerization / Hand Mix Pour in Place

Process Stream ID Code	Process Stream Description	Physical State ¹	Stream Flow (kg/yr)
<u>7A</u>	<u>B component to QC</u>	<u>OL</u>	<u>UK</u>
<u>7D</u>	<u>A component to QC</u>	<u>OL</u>	<u>UK</u>
<u>7B, 7F</u>	<u>A, B components to Stores</u>	<u>OL</u>	<u>UK</u>
<u>7C, 7G</u>	<u>Hand Mix/Pour in Place</u>	<u>OL</u>	<u>UK</u>
<u>7E</u>	<u>T&I Vent Hood</u>	<u>GU</u>	<u>UK</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

¹Use the following codes to designate the physical state for each process stream:

GC = Gas (condensable at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure)
 SO = Solid
 SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

☐ Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

☐ Process type Pre polymerization / Hand Mix
Pour in Place

Process Stream ID Code	Known Compounds ¹	Concentrations ^{2,3} (% or ppm)	Other Expected Compounds	Estimated Concentrations (% or ppm)
<u>7A</u>	<u>Polyol, Amine,</u>	<u>100%</u>	<u>NA</u>	<u>NA</u>
	<u>Water</u>		<u>NA</u>	
<u>7D</u>	<u>TDI, Polyol,</u>	<u>100%</u>	<u>Hydrolyzable</u>	<u>.1%</u>
	<u>Tin, Flame</u>		<u>chloride</u>	
	<u>retardant</u>			
<u>7B, 7C</u>	<u>Same as 7A</u>			
<u>7F, 7G</u>	<u>Same as 7D</u>			

7.06 continued below

☐ Mark (X) this box if you attach a continuation sheet.

7.06 (continued)

¹For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column b. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1	NA	
2		
3		
4		
5		

²Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

³Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

☐ Mark (X) this box if you attach a continuation sheet.

PART A RESIDUAL TREATMENT PROCESS DESCRIPTION

8.01 In accordance with the instructions, provide a residual treatment block flow diagram which describes the treatment process used for residuals identified in question 7.01.

CBI

☐ Process type Prepolymerization / Hand Mix Pour
in Place

*There is no Treatment process for
residual Urethane foam.*

*DOE considers it nonhazardous
thus it is put in the garbage.*

☐ Mark (X) this box if you attach a continuation sheet.

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

[illegible]

☐ Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

¹Use the following codes to designate the type of hazardous waste:

I = Ignitable
C = Corrosive
R = Reactive
E = EP toxic
T = Toxic
H = Acutely hazardous

²Use the following codes to designate the physical state of the residual:

GC = Gas (condensable at ambient temperature and pressure)
GU = Gas (uncondensable at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

8.05 continued below

☐ Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

³For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column d. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
<u>1</u>	<u>N/A</u>	
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		

⁴Use the following codes to designate how the concentration was determined:

A = Analytical result

E = Engineering judgement/calculation

8.05 continued below

☐ Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

⁵Use the following codes to designate how the concentration was measured:

V = Volume

W = Weight

⁶Specify the analytical test methods used and their detection limits in the table below. Assign a code to each test method used and list those codes in column e.

<u>Code</u>	<u>Method</u>	<u>Detection Limit</u> <u>(± ug/l)</u>
<u>1</u>	<u>N/A</u>	<u></u>
<u>2</u>	<u></u>	<u></u>
<u>3</u>	<u></u>	<u></u>
<u>4</u>	<u></u>	<u></u>
<u>5</u>	<u></u>	<u></u>
<u>6</u>	<u></u>	<u></u>

☐ Mark (X) this box if you attach a continuation sheet.

CBI

[illegible]

²Use the codes provided in Exhibit 8-2 to designate the management methods

58

8.22 Describe the combustion chamber design parameters for each of the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

☐

N/A

Incinerator	Combustion Chamber Temperature (°C)		Location of Temperature Monitor		Residence Time In Combustion Chamber (seconds)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
1						
2						
3						

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

8.23 Complete the following table for the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

☐

Incinerator	Air Pollution Control Device ¹	Types of Emissions Data Available
1	NA	NA
2	NA	NA
3	NA	NA

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

¹Use the following codes to designate the air pollution control device:

S = Scrubber (include type of scrubber in parenthesis)

E = Electrostatic precipitator

O = Other (specify) _____

☐

Mark (X) this box if you attach a continuation sheet.

PART A EMPLOYMENT AND POTENTIAL EXPOSURE PROFILE

9.01 Mark (X) the appropriate column to indicate whether your company maintains records on the following data elements for hourly and salaried workers. Specify for each data element the year in which you began maintaining records and the number of years the records for that data element are maintained. (Refer to the instructions for further explanation and an example.)

CBI

☐

Data Element	Data are Maintained for:		Year in Which Data Collection Began	Number of Years Records Are Maintained
	Hourly Workers	Salaried Workers		
Date of hire	<u>X</u>	<u>X</u>	<u>1976</u>	<u>indefinitely</u>
Age at hire	<u>X</u>	<u>X</u>	<u>1976</u>	<u>"</u>
Work history of individual before employment at your facility	<u>X</u>	<u>NA</u>	<u>NA</u>	<u>"</u>
Sex	<u>X</u>	<u>X</u>	<u>1982</u>	<u>"</u>
Race	<u>X</u>	<u>X</u>	<u>1982</u>	<u>"</u>
Job titles	<u>X</u>	<u>X</u>	<u>1982</u>	<u>"</u>
Start date for each job title	<u>X</u>	<u>X</u>	<u>1976</u>	<u>"</u>
End date for each job title	<u>X</u>	<u>X</u>	<u>1976</u>	<u>"</u>
Work area industrial hygiene monitoring data	<u>X</u>	<u>NA</u>	<u>1981</u>	<u>"</u>
Personal employee monitoring data	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Employee medical history	<u>X</u>	<u>X</u>	<u>1982</u>	<u>indefinitely</u>
Employee smoking history	<u>X</u>	<u>NA</u>	<u>1982</u>	<u>NA</u>
Accident history	<u>X</u>	<u>X</u>	<u>1982</u>	<u>indefinitely</u>
Retirement date	<u>X</u>	<u>X</u>	<u>1976</u>	<u>"</u>
Termination date	<u>X</u>	<u>X</u>	<u>1976</u>	<u>"</u>
Vital status of retirees	<u>N/A</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Cause of death data	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

☐ Mark (X) this box if you attach a continuation sheet.

9.02 In accordance with the instructions, complete the following table for each activity in which you engage.

CBI

☐

a.	b.	c.	d.	e.
<u>Activity</u>	<u>Process Category</u>	<u>Yearly Quantity (kg)</u>	<u>Total Workers</u>	<u>Total Worker-Hours</u>
Manufacture of the listed substance	Enclosed	_____	_____	_____
	Controlled Release	_____	_____	_____
	Open	_____	_____	_____
On-site use as reactant	Enclosed	_____	_____	_____
	Controlled Release	_____	_____	_____
	Open	291	_____	_____
On-site use as nonreactant	Enclosed	_____	_____	_____
	Controlled Release	_____	_____	_____
	Open	_____	_____	_____
On-site preparation of products	Enclosed	_____	_____	_____
	Controlled Release	291	_____	_____
	Open	_____	_____	_____

☐ Mark (X) this box if you attach a continuation sheet.

9.03 Provide a descriptive job title for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance.

CBI

☐

Labor Category

Descriptive Job Title

A

Chemical Compounder

B

Quality Control operator

C

Fabricator

D

E

F

G

H

I

J

Footnote: A) Chemical compounder blends TDI with polyol in 5-gal can to make a urethane prepolymer

B) Quality control operator mixes 200 grams of A+B component to ensure proper foaming.

C) Fabricator mixes approximately 200 grams of A+B components to cast flexible urethane crash pads.

☐ Mark (X) this box if you attach a continuation sheet.

CBI

```
graph LR; Polyol --> QC; TBI_Prepolymer[TBI Prepol] --> QC; QC --> Fabrication; subgraph Labels; 1 --> TBI_Prepolymer; A --> 1; 2 --> QC; B --> 2; 3 --> Fabrication; C --> 3; end; style 1 fill:none,stroke:none; style A fill:none,stroke:none; style 2 fill:none,stroke:none; style B fill:none,stroke:none; style 3 fill:none,stroke:none; style C fill:none,stroke:none;
```

The diagram illustrates the synthesis of polyimides. It starts with two main components: **Polyol** and **TBI Prepol**. **Polyol** is processed through a **Compounding** step to form **QC** (Quinacridone Compound). **TBI Prepol** also contributes to the formation of **QC**. The **QC** is then used in the **Fabrication** step to produce the final polyimide product. The process is divided into three numbered stages: **1** (TBI Prepol), **2** (QC), and **3** (Fabrication). These stages are associated with labels **A**, **B**, and **C** respectively.

91

9.05 Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Prepolymerization / Hand mix
Pour in place

Work Area ID

Description of Work Areas and Worker Activities

1

Compounder weighs chemicals in mix vat
and operates air motor for mixer

2

QC mixes A+B component to test foam.

3

Fabricator mixes A+B to make finished
product.

4

5

6

7

8

9

10

☐ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place

Work area 1 compounding

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
<u>1</u>	<u>1</u>	<u>Skin/inhalation</u>	<u>OL/GU</u>	<u>B</u>	<u>15</u>

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensable at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)
 SO = Solid

SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
 B = Greater than 15 minutes, but not exceeding 1 hour
 C = Greater than one hour, but not exceeding 2 hours

D = Greater than 2 hours, but not exceeding 4 hours
 E = Greater than 4 hours, but not exceeding 8 hours
 F = Greater than 8 hours

☒ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place

Work area 2 QC

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
<u>2</u>	<u>1</u>	<u>SKIN/inhalation</u>	<u>OL/GU</u>	<u>A</u>	<u>15</u>

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensable at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)
 SO = Solid

SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
 B = Greater than 15 minutes, but not exceeding 1 hour
 C = Greater than one hour, but not exceeding 2 hours

D = Greater than 2 hours, but not exceeding 4 hours
 E = Greater than 4 hours, but not exceeding 8 hours
 F = Greater than 8 hours

☒ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place
 Work area 3 Fabrication

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
<u>3</u>	<u>4</u>	<u>Skin / inhalation</u>	<u>OL / GU</u>	<u>C</u>	<u>210</u>

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensable at ambient temperature and pressure)	SY = Sludge or slurry
GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)	AL = Aqueous liquid
SO = Solid	OL = Organic liquid
	IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less	D = Greater than 2 hours, but not exceeding 4 hours
B = Greater than 15 minutes, but not exceeding 1 hour	E = Greater than 4 hours, but not exceeding 8 hours
C = Greater than one hour, but not exceeding 2 hours	F = Greater than 8 hours

☐ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Pre polymerization / Hand mix pour in place
 Work area compounding

Labor Category	8-hour TWA Exposure Level (ppm, mg/m ³ , other-specify)	15-Minute Peak Exposure Level (ppm, mg/m ³ , other-specify)
<u>1</u>	<u>.014 ppm</u>	<u>UK</u>

☒ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place
Work area 2 QC

Labor Category	8-hour TWA Exposure Level (ppm, mg/m ³ , other-specify)	15-Minute Peak Exposure Level (ppm, mg/m ³ , other-specify)
<u>2</u>	<u>UK</u>	<u>UK</u>

Footnote: To QC TDI based foam takes
5 min. QC is done under hood

☒ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place
 Work area 3 Fabrication

<u>Labor Category</u>	<u>8-hour TWA Exposure Level (ppm, mg/m³, other-specify)</u>	<u>15-Minute Peak Exposure Level (ppm, mg/m³, other-specify)</u>
<u>3</u>	<u>.000804 ppm</u>	<u>UK</u>

☐ Mark (X) this box if you attach a continuation sheet.

PART B WORK PLACE MONITORING PROGRAM

9.08 If you monitor worker exposure to the listed substance, complete the following table.

CBI

☐

<u>Sample/Test</u>	<u>Work Area ID</u>	<u>Testing Frequency (per year)</u>	<u>Number of Samples (per test)</u>	<u>Who Samples¹</u>	<u>Analyzed In-House (Y/N)</u>	<u>Number of Years Records Maintained</u>
Personal breathing zone	<u>NA</u>					
General work area (air)						
Wipe samples						
Adhesive patches						
Blood samples						
Urine samples						
Respiratory samples						
Allergy tests						
Other (specify)						
Other (specify)						
Other (specify)						

¹Use the following codes to designate who takes the monitoring samples:

A = Plant industrial hygienist

B = Insurance carrier

C = OSHA consultant

D = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

9.09 For each sample type identified in question 9.08, describe the type of sampling and CBI analytical methodology used for each type of sample.

☐ Sample Type Sampling and Analytical Methodology

 _____ *Sampling done by State of*
 _____ *Washington Department of Labor*
 _____ *and Industries*
 _____ *(WISHA consulting)*
 _____ *Rich Gleason (206) 281 5533*

9.10 If you conduct personal and/or ambient air monitoring for the listed substance, specify the following information for each equipment type used.

CBI

☐ Equipment Type¹ Detection Limit² Manufacturer Averaging Time (hr) Model Number

 _____ *see 9.09* _____

¹Use the following codes to designate personal air monitoring equipment types:

- A = Passive dosimeter
- B = Detector tube
- C = Charcoal filtration tube with pump
- D = Other (specify) _____

Use the following codes to designate ambient air monitoring equipment types:

- E = Stationary monitors located within work area
- F = Stationary monitors located within facility
- G = Stationary monitors located at plant boundary
- H = Mobile monitoring equipment (specify) _____
- I = Other (specify) _____

²Use the following codes to designate detection limit units:

- A = ppm
- B = Fibers/cubic centimeter (f/cc)
- C = Micrograms/cubic meter (µ/m³)

☐ Mark (X) this box if you attach a continuation sheet.

9.11 If you conduct routine medical tests for monitoring the health effects of exposure to the listed substance, specify the type and frequency of the tests.

CBI

☐

Test Description

Frequency
(weekly, monthly, yearly, etc.)

NA

☐ Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix Porcin Place
 Work area 1 Compounding

<u>Engineering Controls</u>	<u>Used (Y/N)</u>	<u>Year Installed</u>	<u>Upgraded (Y/N)</u>	<u>Year Upgraded</u>
Ventilation:				
Local exhaust	<u>Y</u>	<u>1976</u>	<u>N</u>	<u>NA</u>
General dilution	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Vessel emission controls	<u>N</u>	<u>NA</u>	<u> </u>	<u> </u>
Mechanical loading or packaging equipment	<u>N</u>	<u>NA</u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☒ Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[] Process type Prepolymerization / Hand Mix Pouring
Work area 2 QC

<u>Engineering Controls</u>	<u>Used (Y/N)</u>	<u>Year Installed</u>	<u>Upgraded (Y/N)</u>	<u>Year Upgraded</u>
Ventilation:				
Local exhaust	<u>Y</u>	<u>1985</u>	<u>N</u>	<u>NA</u>
General dilution	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Vessel emission controls	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Mechanical loading or packaging equipment	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>

[X] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Pre polymerization / Hand mix pour in place
 Work area 3 Fabrication

<u>Engineering Controls</u>	<u>Used (Y/N)</u>	<u>Year Installed</u>	<u>Upgraded (Y/N)</u>	<u>Year Upgraded</u>
Ventilation:				
Local exhaust	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
General dilution	<u>Y</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Vessel emission controls	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Mechanical loading or packaging equipment	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type NA

Work area

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
<u>NA</u>	

☐ Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place
Work area 1 Compounding

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>Y</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>Y</u>
Coveralls	<u>Y</u>
Bib aprons	<u>Y</u>
Chemical-resistant gloves	<u>Y</u>
Other (specify)	
_____	_____
_____	_____

☒ Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Prepolymerization / Hand mix pour in place
Work area 2 QC

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>N</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>N</u>
Coveralls	<u>N</u>
Bib aprons	<u>Y</u>
Chemical-resistant gloves	<u>Y</u>
Other (specify)	
_____	_____
_____	_____

☒ Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Pre polymerization / Hand mix pour in place
Work area 3 Fabrication

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>N</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>N</u>
Coveralls	<u>N</u>
Bib aprons	<u>Y</u>
Chemical-resistant gloves	<u>Y</u>
Other (specify)	
_____	_____
_____	_____

☐ Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Prepolymerization / Hand mix pour in place

Work Area	Respirator Type	Average Usage ¹	Fit Tested (Y/N)	Type of Fit Test ²	Frequency of Fit Tests (per year)
<u>1</u>	<u>North full face organic vapor + dust</u>	<u>B,C</u>	<u>Y</u>	<u>QL/QT</u>	<u>each time</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

¹Use the following codes to designate average usage:

A = Daily
 B = Weekly
 C = Monthly
 D = Once a year
 E = Other (specify) _____

²Use the following codes to designate the type of fit test:

QL = Qualitative
 QT = Quantitative

☐ Mark (X) this box if you attach a continuation sheet.

PART B WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Prepolymerization/Hand mix pour in place

Work area 1 Compounding

Worker Right To Know, Warning signs
chemical Hood

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Prepolymerization/Hand mix pour in place

Work area 1 Compounding

<u>Housekeeping Tasks</u>	<u>Less Than Once Per Day</u>	<u>1-2 Times Per Day</u>	<u>3-4 Times Per Day</u>	<u>More Than 4 Times Per Day</u>
<u>Sweeping</u>	<u>X</u>			
Vacuuming				
Water flushing of floors				
Other (specify)				

☒ Mark (X) this box if you attach a continuation sheet.

PART B WORK PRACTICES

- 9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Prepolymerization / Hand Mix pour in place

Work area 2 QC

Worker Right to Know

Warning Labels

Chemical Hood

- 9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Prepolymerization / Hand Mix pour in place

Work area 2 QC

<u>Housekeeping Tasks</u>	<u>Less Than Once Per Day</u>	<u>1-2 Times Per Day</u>	<u>3-4 Times Per Day</u>	<u>More Than 4 Times Per Day</u>
<u>Sweeping</u>	<u>X</u>			
Vacuuming				
Water flushing of floors				
Other (specify)				

☒ Mark (X) this box if you attach a continuation sheet.

PART B WORK PRACTICES

- 9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Prepolymerization / Hand Mix pour in place
Work area 3 Fabrication

Worker Right To Know
Warning Labels

- 9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Prepolymerization / Hand Mix pour in place
Work area 3 Fabrication

<u>Housekeeping Tasks</u>	<u>Less Than Once Per Day</u>	<u>1-2 Times Per Day</u>	<u>3-4 Times Per Day</u>	<u>More Than 4 Times Per Day</u>
<u>Sweeping</u>		<u>X</u>		
Vacuuming				
Water flushing of floors				
Other (specify)				

☐ Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

☒ No 2

Emergency exposure

Yes 1

☒ No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: _____

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes 1

☒ No 2

If yes, where are copies of the plan maintained? _____

Has this plan been coordinated with state or local government response organizations?
Circle the appropriate response.

Yes 1

☒ No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

Plant safety specialist 1

Insurance carrier 2

OSHA consultant 3

Other (specify) Area Supervisor 4

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 10 ENVIRONMENTAL RELEASE

General Instructions:

Complete Part E (questions 10.23-10.35) for each non-routine release involving the listed substance that occurred during the reporting year. Report on all releases that are equal to or greater than the listed substance's reportable quantity value, RQ, unless the release is federally permitted as defined in 42 U.S.C. 9601, or is specifically excluded under the definition of release as defined in 40 CFR 302.3(22). Reportable quantities are codified in 40 CFR Part 302. If the listed substance is not a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and, thus, does not have an RQ, then report releases that exceed 2,270 kg. If such a substance however, is designated as a CERCLA hazardous substance, then report those releases that are equal to or greater than the RQ. The facility may have answered these questions or similar questions under the Agency's Accidental Release Information Program and may already have this information readily available. Assign a number to each release and use this number throughout this part to identify the release. Releases over more than a 24-hour period are not single releases, i.e., the release of a chemical substance equal to or greater than an RQ must be reported as a separate release for each 24-hour period the release exceeds the RQ.

For questions 10.25-10.35, answer the questions for each release identified in question 10.23. Photocopy these questions and complete them separately for each release.

PART A GENERAL INFORMATION

10.01 Where is your facility located? Circle all appropriate responses.

CBI

- ☐ Industrial area 1
- Urban area 2
- ☒ Residential area 3
- Agricultural area 4
- Rural area 5
- Adjacent to a park or a recreational area 6
- Within 1 mile of a navigable waterway 7
- ☒ Within 1 mile of a school, university, hospital, or nursing home facility 8
- Within 1 mile of a non-navigable waterway 9
- Other (specify) _____ 10

☐ Mark (X) this box if you attach a continuation sheet.

- 10.02 Specify the exact location of your facility (from central point where process unit is located) in terms of latitude and longitude or Universal Transverse Mercader (UTM) coordinates.

Latitude 47 . 33 . 12 .

Longitude 122 . 16 . 58 .

UTM coordinates Zone _____, Northing _____, Easting _____

- 10.03 If you monitor meteorological conditions in the vicinity of your facility, provide the following information.

Average annual precipitation UK inches/year

Predominant wind direction UK

- 10.04 Indicate the depth to groundwater below your facility.

Depth to groundwater UK meters

- 10.05 For each on-site activity listed, indicate (Y/N/NA) all routine releases of the listed substance to the environment. (Refer to the instructions for a definition of CBI Y, N, and NA.)

☐

On-Site Activity	Environmental Release		
	Air	Water	Land
Manufacturing	<u>NA</u>	<u>NA</u>	<u>NA</u>
Importing	<u>NA</u>	<u>NA</u>	<u>NA</u>
Processing	<u>Y</u>	<u>N</u>	<u>N</u>
Otherwise used	<u>NA</u>	<u>NA</u>	<u>NA</u>
Product or residual storage	<u>NA</u>	<u>NA</u>	<u>N</u>
Disposal	<u>NA</u>	<u>NA</u>	<u>NA</u>
Transport	<u>NA</u>	<u>NA</u>	<u>NA</u>

☐ Mark (X) this box if you attach a continuation sheet.

10.06 Provide the following information for the listed substance and specify the level of precision for each item. (Refer to the instructions for further explanation and an example.)

CBI

☐

Quantity discharged to the air	<u>UK</u>	kg/yr ± ____ %
Quantity discharged in wastewaters	<u>N/A</u>	kg/yr ± ____ %
Quantity managed as other waste in on-site treatment, storage, or disposal units	<u>N/A</u>	kg/yr ± ____ %
Quantity managed as other waste in off-site treatment, storage, or disposal units	<u>N/A</u>	kg/yr ± ____ %

☐ Mark (X) this box if you attach a continuation sheet.

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

☐

Process type

NA

<u>Stream ID Code</u>	<u>Control Technology</u>	<u>Percent Efficiency</u>
	NA	

☐

Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

- 10.09 Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

Process type Prepolymerization / Hand mix pool in place

Point Source
ID Code

Description of Emission Point Source

1

Stack emission from
prepol mix vat = 5 gal vat

☐ Mark (X) this box if you attach a continuation sheet.

☐ Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CHI

Point Source ID Code	Physical State	Average Emissions (kg/day)	Frequency ² (days/yr)	Duration ³ (min/day)	Average Emission Factor ⁴	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
1	V	UK	15	700	UK	UK	UK	UK

¹Use the following codes to designate physical state at the point of release:
G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

²Frequency of emission at any level of emission

³Duration of emission at any level of emission

⁴Average Emission Factor — Provide estimated (± 25 percent) emission factor (kg of emission per kg of production of listed substance)

CBI

[]

[illegible]²Width of attached or adjacent building

³Use the following codes to designate vent type:

V = Vertical

☐ Mark (X) this box if you attach a continuation sheet.

10.12 If the listed substance is emitted in particulate form, indicate the particle size distribution for each Point Source ID Code identified in question 10.09. Photocopy this question and complete it separately for each emission point source.

CBI

☐

NA

Point source ID code

Size Range (microns)

Mass Fraction (% ± % precision)

< 1

≥ 1 to < 10

≥ 10 to < 30

≥ 30 to < 50

≥ 50 to < 100

≥ 100 to < 500

≥ 500

Total = 100%

☐ Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type NA
 Percentage of time per year that the listed substance is exposed to this process type %

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					Greater than 99%
	Less than 5%	5-10%	11-25%	26-75%	76-99%	
Pump seals ¹						
Packed						
Mechanical						
Double mechanical ²						
Compressor seals ¹						
Flanges						
Valves						
Gas ³						
Liquid						
Pressure relief devices ⁴ (Gas or vapor only)						
Sample connections						
Gas						
Liquid						
Open-ended lines ⁵ (e.g., purge, vent)						
Gas						
Liquid						

¹List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

☐ Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

²If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

³Conditions existing in the valve during normal operation

⁴Report all pressure relief devices in service, including those equipped with control devices

⁵Lines closed during normal operation that would be used during maintenance operations

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c.

CBI

☐

NA

a. Number of Pressure Relief Devices	b. Percent Chemical in Vessel ¹	c. Control Device	d. Estimated Control Efficiency ²

¹Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

²The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

☐ Mark (X) this box if you attach a continuation sheet.

10.15 Equipment Leak Detection -- If a formal leak detection and repair program is in place, complete the following table regarding those leak detection and repair procedures. Photocopy this question and complete it separately for each process type.

CBI

☐

Process type

NA

Equipment Type	Leak Detection	Detection Device ¹	Frequency of Leak Detection (per year)	Repairs Initiated (days after detection)	Repairs Completed (days after initiated)
	Concentration (ppm or mg/m ³) Measured at _____ Inches from Source				
Pump seals					
Packed	_____	_____	_____	_____	_____
Mechanical	_____	_____	_____	_____	_____
Double mechanical	_____	_____	_____	_____	_____
Compressor seals	_____	_____	_____	_____	_____
Flanges	_____	_____	_____	_____	_____
Valves					
Gas	_____	_____	_____	_____	_____
Liquid	_____	_____	_____	_____	_____
Pressure relief devices (gas or vapor only)	_____	_____	_____	_____	_____
Sample connections					
Gas	_____	_____	_____	_____	_____
Liquid	_____	_____	_____	_____	_____
Open-ended lines					
Gas	_____	_____	_____	_____	_____
Liquid	_____	_____	_____	_____	_____

¹Use the following codes to designate detection device:

POVA = Portable organic vapor analyzer

FPM = Fixed point monitoring

0 = Other (specify) _____

☐

Mark (X) this box if you attach a continuation sheet.

☐ Mark (X) this box if you attach a continuation sheet.

10.16 Raw Material, Intermediate and Product Storage Emissions - - Complete the following table by providing the information on each liquid raw material, intermediate, and product storage vessel containing the listed substance as identified in your process block or residual treatment block flow diagram(s).

Vessel Type ¹	Floating Roof ² Seals ²	Composition of Stored ³ Materials ³	Throughput (liters per year)	Vessel Filling Rate (gpm)	Vessel Filling Duration (min)	Vessel Inner Diameter (m)	Vessel Height (m)	Vessel Volume (l)	Operating Vessel Emission Controls ⁴	Design Flow Rate ⁵	Vent Diameter (cm)	Control Efficiency (%)	Basis for Estimate ⁶

¹Use the following codes to designate vessel type:

- F = Fixed roof
- CIF = Contact internal floating roof
- NCIF = Noncontact internal floating roof
- EFR = External floating roof
- P = Pressure vessel (indicate pressure rating)
- H = Horizontal
- U = Underground

²Use the following codes to designate floating roof seals:

- MS1 = Mechanical shoe, primary
- MS2 = Shoe-mounted secondary
- MS2R = Rim-mounted, secondary
- LM1 = Liquid-mounted resilient filled seal, primary
- LM2 = Rim-mounted shield
- LMW = Weather shield
- VM1 = Vapor mounted resilient filled seal, primary
- VM2 = Rim-mounted secondary
- VMW = Weather shield

³Indicate weight percent of the listed substance. Include the total volatile organic content in parenthesis

⁴Other than floating roofs

⁵Gas/vapor flow rate the emission control device was designed to handle (specify flow rate units)

⁶Use the following codes to designate basis for estimate of control efficiency:

- C = Calculations
- S = Sampling

PART B NON-ROUTINE RELEASES

10.23 Indicate the date and time when the release occurred and when the release ceased or was stopped. If there were more than six releases, attach a continuation sheet and list all releases.

<u>Release</u>	<u>Date Started</u>	<u>Time (am/pm)</u>	<u>Date Stopped</u>	<u>Time (am/pm)</u>
<u>1</u>	_____	_____	_____	_____
<u>2</u>	_____	_____	_____	_____
<u>3</u>	_____	_____	_____	_____
<u>4</u>	_____	_____	_____	_____
<u>5</u>	_____	_____	_____	_____
<u>6</u>	_____	_____	_____	_____

10.24 Specify the weather conditions at the time of each release.

<u>Release</u>	<u>Wind Speed (km/hr)</u>	<u>Wind Direction</u>	<u>Humidity (%)</u>	<u>Temperature (°C)</u>	<u>Precipitation (Y/N)</u>
<u>1</u>	_____	_____	_____	_____	_____
<u>2</u>	_____	_____	_____	_____	_____
<u>3</u>	_____	_____	_____	_____	_____
<u>4</u>	_____	_____	_____	_____	_____
<u>5</u>	_____	_____	_____	_____	_____
<u>6</u>	_____	_____	_____	_____	_____

☐ Mark (X) this box if you attach a continuation sheet.



OCEAN® Network
EMERGENCY PHONE 1-800-OLIN-911

MATERIAL SAFETY DATA

MAR 87 1987

SECTION I - IDENTIFICATION

MSDS FILE 563

CHEMICAL NAME & SYNONYMS Toluene Diisocyanate 80-20		
CHEMICAL FAMILY Isocyanate	FORMULA $C_9H_6N_2O_2$	PRODUCT TDI 80-20
DESCRIPTION Clear colorless to pale yellow liquid with sharp pungent odor		CAS NO. 26471-62-5

SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Harmful if swallowed. Avoid contact with eyes, skin or clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor. Protect against physical damage. Store in a cool, dry, well-ventilated place, away from areas where a fire hazard may be acute. Outside or detached storage is preferred. Blanket storage tanks with inert gas (nitrogen) or dry air. Separate from oxidizing materials.	
PROTECTIVE EQUIPMENT EYES Goggles GLOVES Rubber, NBR or PVA OTHER Coveralls, impervious footwear	VENTILATION REQUIREMENTS As required to keep airborne concentrations below TLV

SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	OSHA PEL	LD50	LC50	SIGNIFICANT EFFECTS
Toluene-2,4-diisocyanate CAS No. 584-84-9	0.02 ppm ceiling	5.8 g/kg (rat)	10 ppm/4 hrs (mouse)	Skin, eye, mucous membrane irritation. Pulmonary irritant. Allergic sensitization to skin and respiratory tract. May cause asthma attacks.
Toluene-2,6-diisocyanate, CAS No. 91-08-7	None established	No data	11 ppm/4 hrs-mouse	Irritation

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 270°F CDC METHOD	OSHA CLASSIFICATION Not Regulated (Ignitable)	FLAMMABLE EXPLOSIVE LIMIT	LOWER 0.9%	UPPER 9.5%
EXTINGUISHING MEDIA Water, carbon dioxide or dry chemical. Use water to keep the exposed containers cool.				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Water spray should be used to cool fire exposed containers and/or to disperse unignited vapors. Use NIOSH/MSHA approved positive pressure self-contained breathing apparatus when any material is involved in a fire.				

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE 0.005 ppm TWA, 0.02 ppm STEL - 2,4 TDI (ACGIH 1987-88)
SYMPTOMS OF OVER EXPOSURE May cause irritation to eyes, throat, lungs, stomach, skin. Allergic sensitization to skin and respiratory tract. May cause asthma attacks
EMERGENCY FIRST-AID PROCEDURES
SKIN Immediately flush thoroughly with water for 15 minutes, call a physician.
EYES Immediately flush thoroughly with water for 15 minutes, call a physician.
INGESTION Immediately drink large quantities of water to dilute.
INHALATION Immediately remove victim to fresh air. Call a physician.

SECTION VI - TOXICOLOGY (PRODUCT)

ACUTE ORAL LD 50 5.8 g/kg (rats). Harmful if swallowed.	CARCINOGENICITY Oral Exposure-Positive NTP Bioassay
ACUTE DERMAL LD 50 > 2 g/kg (rabbits)	MUTAGENICITY Not known to be mutagenic
ACUTE INHALATION LC 50 10 ppm/4 hrs (mouse)	EYE IRRITATION Irritation and/or burns
	PRIMARY SKIN IRRITATION Irritation and/or burns
PRINCIPAL ROUTES OF ABSORPTION Inhalation, dermal contact	
EFFECTS OF ACUTE EXPOSURE May cause irritation to lungs, eyes, throat, stomach, skin. Allergic sensitization of skin and respiratory tract. Corneal injury may occur.	
EFFECTS OF CHRONIC EXPOSURE Damage/allergic sensitization to lungs. Inhalation studies indicate not carcinogenic. Carcinogenic risk from industrial use is not significant.	

SECTION VII - SPILL AND LEAKAGE PROCEDURES (CONTROL PROCEDURES)

ACTION FOR MATERIAL RELEASE OR SPILL

Wear NIOSH/MSHA approved positive pressure supplied air respirator. Follow OSHA regulations for respirator use (see 29 CFR 1910.134). Wear goggles, coveralls and impervious gloves and boots. Add dry non-combustible absorbent, sweep up material and place in an approved DOT container. Add an equal amount of neutralizing solution to the container (90-95% water, 5-10% ammonia). Clean remaining surfaces with neutralizing solution and add this to container. Isolate container in a well-ventilated place and do not seal for 24 hrs. Ammonia vapors may be generated until solution is neutralized. Wash all contaminated clothing before reuse. In the event of a large spill use the telephone number shown on the front of this sheet.

TRANSPORTATION EMERGENCY, CONTACT CHEMTREC 800-424-9300

Dispose of contaminated product, empty containers and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate Federal, State and local regulatory agencies to ascertain proper disposal procedures.

SECTION VIII - SHIPPING DATA

D.O.T. Toluene diisocyanate Poison B UN 2078

SECTION IX - REACTIVITY DATA

STABLE <input checked="" type="checkbox"/> UNSTABLE <input type="checkbox"/> AT <input type="checkbox"/> C <input type="checkbox"/> F <input type="checkbox"/>	HAZARDOUS POLYMERIZATION	MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR <input type="checkbox"/>
CONDITIONS TO AVOID Water or incompatible materials in a closed system, excess heat INCOMPATIBILITY (MATERIAL TO AVOID) Acids, bases and alcohols, surface active materials		
HAZARDOUS DECOMPOSITION PRODUCTS Carbon monoxide, nitrogen oxides, hydrogen cyanide		

SECTION X - PHYSICAL DATA

MELTING POINT 53-56°F	VAPOR PRESSURE .01mmHg, 20°C	VOLATILES No data
BOILING POINT 484°F	SOLUBILITY IN WATER Insoluble	EVAPORATION RATE No data
SPECIFIC GRAVITY (H ₂ O=1) 1.22	PH No data	VAPOR DENSITY (AIR=1) 6.0

INFORMATION: FURNISHED TO

10013184

FURNISHED BY

DATE

SEPTEMBER 9, 1987

ATTN: DEPT HANDLING MATL SAFETY DATA SHEETS
FLUOROCARBON CO INC
P O BOX 18319
SEATTLE WA 98118

Department of Environmental Hygiene and Toxicology
(203) 789-5436

Olin CORPORATION

120 Long Ridge Road, Stamford, Connecticut 06904

OCEAN® Network

EMERGENCY PHONE 1-800-OLIN-911

TOLUENE DIISOCYANATE



TDI

 **lin** CHEMICALS

INTRODUCTION

Olin toluene diisocyanate (TDI) is produced at Lake Charles, La., and Moundsville, W. Va. The two have a combined annual capacity approaching 200 million pounds — making Olin the second largest producer of TDI in the world.

Our position as a TDI supplier is particularly strong because Olin is one of the few manufacturers independent of outside sources for such key precursor chemicals as chlorine, ammonia and nitric acid. In fact, Olin's degree of integration for producing TDI is unmatched by any other U.S. supplier.

Independence in raw materials and the security of two producing plants make Olin a particularly reliable TDI source for the urethanes industry.

Olin in Urethanes

Olin's experience in urethanes goes back more than 20 years. In addition to TDI, Olin produces many other products for rigid and flexible foams and for non-foams. These products include: polyether polyols, rigid foam systems, chemicals and dispensing equipment, and flame retardants*.

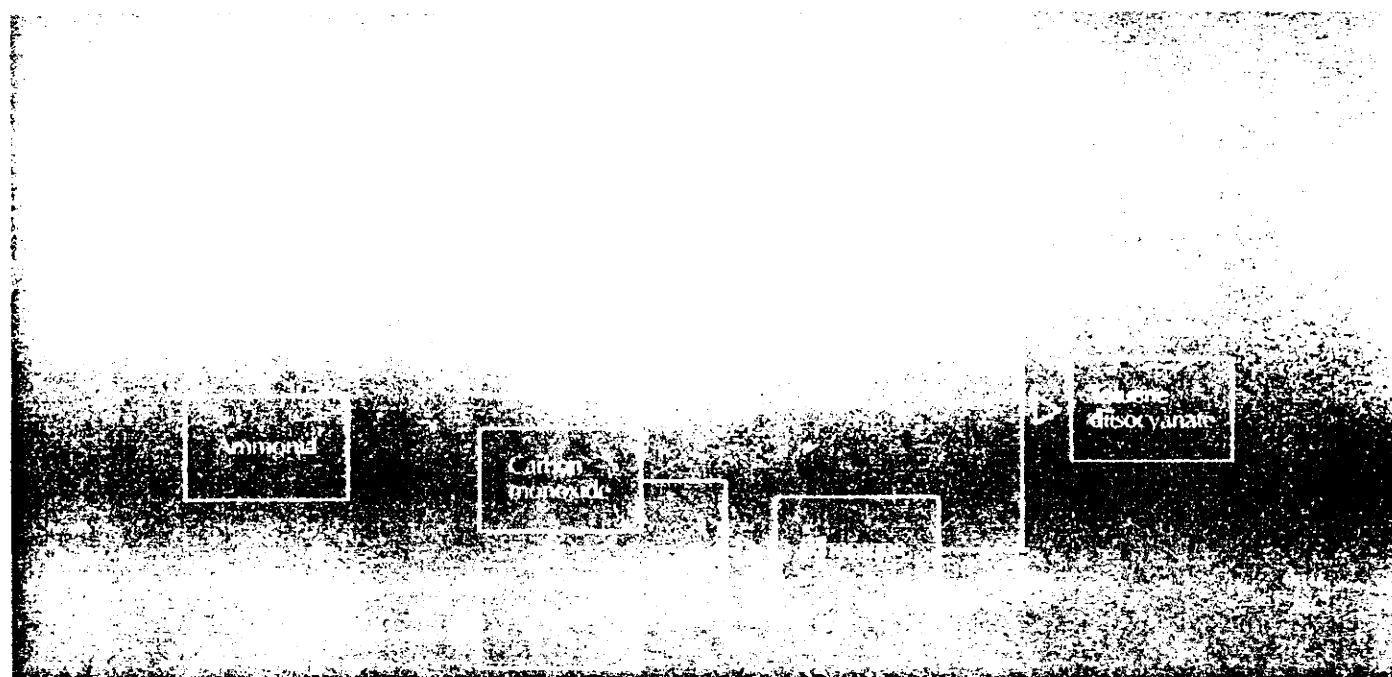
Olin urethane products are produced in five plants in the U.S. and in three more overseas. Domestically, all products are available at the plants and various products are available from urethane distribution centers in New Jersey, Indiana, Texas and California. (For availability of TDI, see page 3.)

Olin can provide valuable on-site assistance, including a seminar on safety and handling, to users of TDI and other urethane products. Additional comprehensive analytical capability and technical services are available from our Application Research and Customer Service Laboratories in New Haven, Connecticut.

If you have any questions regarding the application, handling or use of TDI not answered by this brochure, please contact your nearest Olin Sales Office (see back cover). Or write: Market Manager, TDI, Olin Chemicals, 120 Long Ridge Road, Stamford, CT 06904.

TABLE OF CONTENTS

Introduction	2
Properties	2
TDI Shipments	3
Unloading	4
Temperature	
Sampling	
Procedure for an A-Level Sample	
TDI Tank Cars	
Tank Car Connections — General	
Tie Unloading of TDI	
Bottom Unloading of TDI	
Unloading Tank Trucks	
Unloading Drums	
Thawing TDI Tank Cars	7
How to Determine if TDI is Frozen	
When to Heat a TDI Tank Car	
Heating a TDI Tank Car	
After the TDI is Thawed	
Storage of TDI	9
Storage Tank Design	
Materials of Construction	
Hose and Piping	
Auxiliary Equipment	
Handling TDI	10
Reactivity Hazards	
Fire Hazard	
Health Hazards	
Protective Clothing	
What to Do In Case Of...	
Emergency Actions	12
First Aid	
Handling Spills and Leaks	
Leaking Drums	

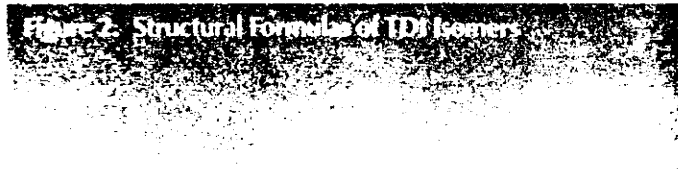


*The term "flame retardant" is a relative term and is not intended to indicate hazards presented by foams under actual fire conditions.

PROPERTIES

• Olin toluene diisocyanate is referred to as TDI-80 because it is an 80:20 mixture of the 2,4- and 2,6-isomers of TDI. Structural formulas of these isomers are shown in Figure 2.

Figure 2. Structural Formulas of TDI Isomers



Olin produces TDI-80 in two forms, designated Type I and Type II. Both have the 80:20 isomer ratio, but they differ slightly in acidity and hydrolyzable chloride content.

Type I is used in foam and non-foam urethanes. Type II is used in non-foam urethanes, rebonded flexible foam, and other applications.

Physical properties of TDI-80, Types I and II, are shown in Figure 3. Those properties marked by an asterisk (*) are Olin specifications; others are typical of commercially available TDI.

TDI has a sharp, pungent, sweetish odor. Its vapors are toxic. For this reason, certain precautions are necessary when handling or using toluene diisocyanate. For complete information, see "Handling TDI," page 10.

Reactivity

Olin TDI is a clear liquid, water white to light yellow in color. It yellows on exposure to light.

Chemical. TDI is a base. It reacts readily with compounds containing active hydrogens, such as acids and alcohols. Contact with other bases, such as caustic soda or tertiary amines, might cause uncontrollable polymerization and the rapid evolution of heat.

Water. On contact with water, aromatic poly-substituted ureas ("polyurea") are formed, and carbon dioxide gas is evolved. In time, white urea crystals will precipitate.

Heat. High temperatures can cause formation of dimer and discoloration of the TDI. This phenomenon is time- and temperature-related (see Figure 4). When the level of dimer approaches 1% by weight, solid dimer forms as needle-like white crystals. These crystals cannot be completely filtered out because the solution is supersaturated and new crystals are formed.

Low temperatures, below 15°C (59°F), cause TDI to freeze. Frozen TDI is also white and crystalline.

NOTE: As can be seen from the above discussion, if white crystals are detected in TDI they may be frozen TDI, polyurea or dimer. For suggestions in dealing with this situation, see "What To Do In Case Of . . .", page 10.

Figure 3. Physical Properties

Molecular Weight	174.163
Assay*, min (%)	99.7
Isomer Ratio* (%)	
2,4-isomer	80 ± 1
2,6-isomer	20 ± 1
Acidity*, as HCl (%)	
Type I	0.002-0.004
Type II	0.008-0.010
Hydrolyzable Chlorides * (%)	
Type I	0.003-0.008
Type II	0.011-0.014
Chlorine*, max (%)	0.20
Ash (ppm)	20
Color (APHA)	15
Specific Gravity (<i>d</i> _{25/25°C [77/77°F]})	1.22 ± 0.01
Density (lbs per gal)	
<i>d</i> _{15.5°C [60°F]}	10.23
<i>d</i> _{20°C [68°F]}	10.14
<i>d</i> _{38°C [100°F]}	10.02
<i>d</i> _{60°C [140°F]}	9.86
Viscosity (cSt)	
<i>d</i> _{50°C [122°F]}	1.5
<i>d</i> _{100°C [212°F]}	0.8
<i>d</i> _{135°C [275°F]}	0.5
Melting Point Range (°C)	11.5-13.5
(°F)	52.7-56.3
Freezing Point	
2,4-isomer (°C)	15.0
(°F)	59.0
2,6-isomer (°C)	7.2
(°F)	45.0
Boiling Point	
<i>d</i> _{10mm Hg (°C)}	121
(°F)	250
<i>d</i> _{760mm Hg (°C)}	251*
(°F)	484*
Flash Point [†] , COC (°C)	135
(°F)	275
Fire Point, COC (°C)	142
(°F)	288
Latent Heat of Evaporation (Btu/lb)	
<i>d</i> _{120°C [248°F]}	131
<i>d</i> _{180°C [356°F]}	121
Vapor Density (air = 1)	6
Vapor Pressure, approx. (mm Hg)	
<i>d</i> _{20°C [68°F]}	0.01
<i>d</i> _{120°C [248°F]}	10
<i>d</i> _{130°C [266°F]}	16

**The flammability properties of this material (or any other material) are not intended to reflect the fire hazards presented by any resultant cellular or foamed plastic product.*



TDI SHIPMENTS

Olin TDI-80 is produced in Lake Charles, Louisiana, and Moundsville, West Virginia. It may be obtained from these plants in tank cars, tank trucks or drums. Olin TDI is also shipped to distribution centers in Texas and California. TDI can also be exported, via ocean vessels, from these distribution centers.

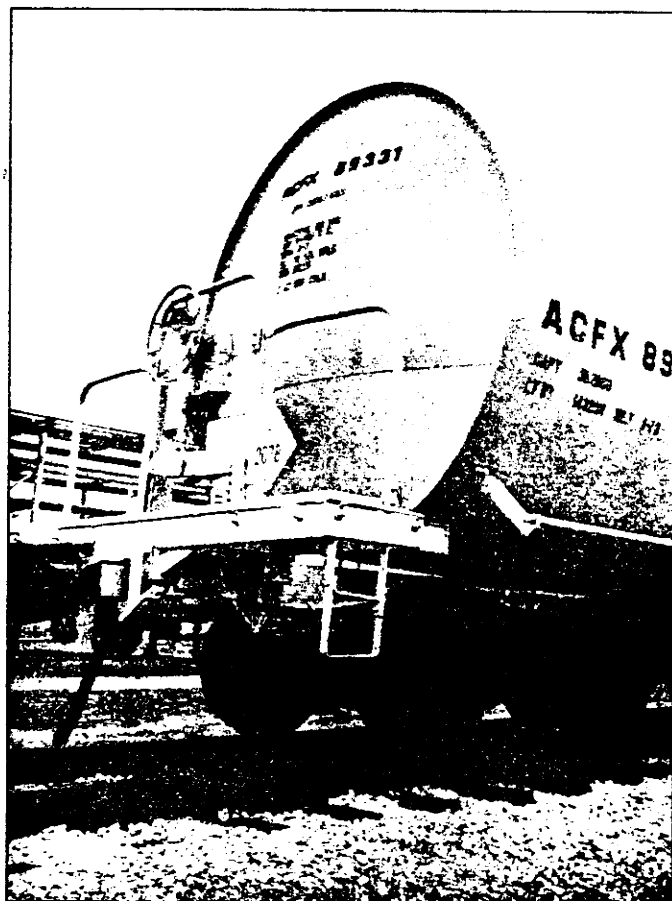
Regardless of type of shipping container, TDI is always shipped under a nitrogen pad to prevent contamination by water vapor. To estimate weight of the contents of a given container, multiply the number of gallons by 10 (e.g. a 55-gallon drum contains 550 lbs. of TDI).

Tank cars. TDI is usually shipped in cars of 20,000-gallon capacity. Other sizes, however, are also available. Although all cars have exterior coils and are insulated, Olin cannot guarantee arrival temperatures with tank car deliveries.

Tank trucks. Capacity is 4,000 gallons. Tanks are constructed of lined steel or stainless steel. Though not all trucks are insulated, Olin delivers at temperatures within the range specified by the customer.

Drums. TDI-80 is available in 55-gallon non-returnable drums constructed of a minimum of 18-gauge steel, with a phosphatized interior.

Ocean vessels. Olin has the capability to serve world markets with shipments of large quantities of TDI in ocean tankers. Evaluation of this possibility involves the coordinated advice of marine transportation, technical service and production personnel.



UNLOADING

Customers should give careful consideration to the way that TDI will be received. Adequate facilities must be provided (see "Storage of TDI," page 9).

Toluene diisocyanate is regulated by the Department of Transportation (DOT) as a Class B poison. Since TDI can cause serious injury to the lungs, eyes and skin, all workers must wear protective clothing and equipment. They should observe all prescribed safe-handling procedures and practices. The section of this brochure entitled "Handling TDI" should be carefully read by, and explained to, all employees.

Temperature

TDI-80 is normally loaded into insulated tank cars or trucks at 24-30°C (75-86°F); in winter, at 38-43°C (100-110°F). On arrival, the temperature of the TDI should be taken. Recommended unloading temperature is 21-30°C (70-86°F).

If the temperature is between 17°C and 21°C (62-70°F) the TDI can be heated. If the temperature is below 17°C it is likely that there is some freezing, and the TDI must be thawed.

For methods of temperature measurement and thawing TDI in tank cars, see page 7.

Sampling

A sample of TDI should be taken for testing before unloading a tank car, truck or drum. While this is being done, goggles and other necessary protective equipment must be worn (see page 11).

Olin tank trucks are equipped with a sampling tube. For tank cars, the preferred procedure is to take the sample from the unloading line (through a customer-installed valve). This avoids opening the manway cover and loss of the nitrogen pad, and thus eliminates a possible source of contamination.

If a sample is taken through this valve, first flush out 1-5 gallons of TDI (for proper disposal procedure, see "Handling Spills & Leaks," page 12). Flushing ensures that a representative sample is being taken. This is particularly important in determining if urea or dimer (white precipitates) are present.

If a sample must be taken directly from a pressurized car or truck manway, be sure it is an "all-level" sample, taken from each compartment, at or near atmospheric pressure. Car hatches should be open for as little time as possible. During inclement weather make provision to prevent contamination of the product.

Procedure for an All-Level Sample

The sample is taken using a glass bottle in a weighted bottle holder. To be sure of getting a representative sample, the bottle holder should be lowered to the bottom and then withdrawn at such a rate that the bottle is not quite full when it reaches the surface. (This may take some practice.)

The bottle should then be capped, cleaned and plainly labeled with product lot numbers, tank car or truck number, compartment number (if more than one), date and sampler's initials.

NOTE: While the following section is on unloading tank cars, many of the principles apply to receipt by other means, and employees should be familiar with them.

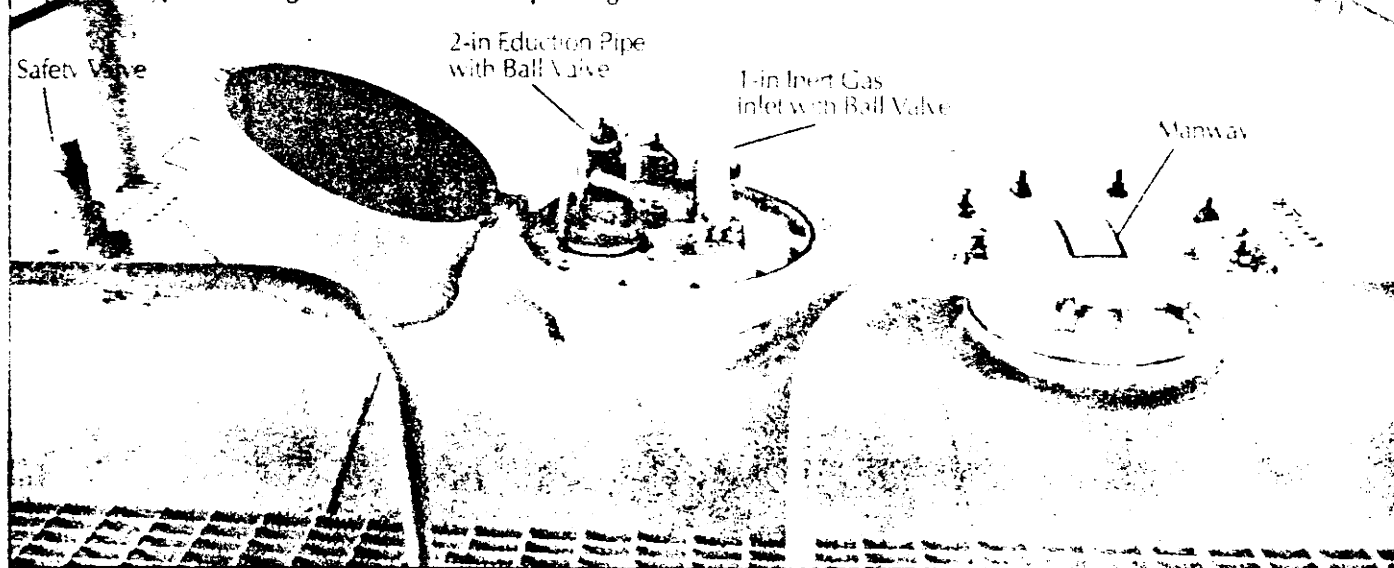
TDI Tank Cars

Olin operates a large fleet of dedicated TDI tank cars. Most have a capacity of 20,000 gallons, although other sizes are available. Figure 5 shows a typical arrangement of the top fittings. While there may be some differences in the location of the fittings on the top of the car, the following are on every TDI car, regardless of type:

- Manway
- Safety valve
- 2-inch eduction pipe with a ball valve
- 1-inch inert gas inlet valve

All of the cars are designed for top unloading through the eduction pipe (Figure 6). Some cars originally could be unloaded from the bottom. Some of these have internal foot valves which can be identified by a valve handle on the top of the car. However, on most of the cars which could be bottom unloaded the valves have been permanently closed. Even on those where bottom unloading is still possible, top unloading is the preferred method.

Figure 5 - Typical Arrangement of Tank Car Top Fittings



TDI tank cars are insulated to prevent freezing. However, in the event freezing occurs, all cars have steam coils for thawing the TDI and the bottom outlet valves (see "Thawing TDI Tank Cars," page 7).

Tank Car Unloading — General

Department of Transportation regulations for unloading tank cars are listed in Section 174.67 of Title 49 Code of Federal Regulations, *Hazardous Materials Regulations*. All persons responsible for tank car unloading should be familiar with these regulations and all applicable requirements should be observed. Some of those requirements are:

1. Unloading operations must be performed only by reliable persons properly instructed in unloading hazardous materials and made responsible for careful compliance with this part. [174.67 (a) (1)]
2. Brakes must be set and wheels blocked on all cars being unloaded. [174.67 (a) (2)]
3. Caution signs must be so placed on the track or cars to give necessary warning to persons approaching the cars from the open end of a siding. Signs must be left up until after the cars are unloaded and disconnected from the discharge connection. [174.67 (a) (3)]
4. Unloading connections must be securely attached to unloading pipes on the dome or to the bottom discharge outlets before any discharge valves are opened. [174.67 (h)]
5. Tank cars may not be allowed to stand with unloading connections attached after unloading is completed. Throughout the entire period of unloading, and while car is connected to unloading device, the car must be attended by the unloader. [174.67 (i)]

6. If necessary to discontinue unloading a tank car for any reason, all unloading connections must be disconnected. All valves must first be tightly closed, and the closures of all other openings securely applied. [174.67 (j)]
7. As soon as a tank car is completely unloaded, all valves must be made tight, the unloading connections must be removed and all other closures made tight, except that heater coil inlet and outlet pipes must be left open for drainage. If it has been opened, the manway cover must be reappplied by the use of a bar or wrench, the outlet valve reducer and outlet valve cap replaced by the use of a wrench having a handle at least 36 inches long, and the outlet valve cap plug, end plug, and all other closures of openings and of their protective housings must be closed by the use of a suitable tool. [174.67 (k)]

Other important suggestions which are not part of the regulations are:

1. The tank car must be protected during unloading by such means as derails or locked switches.
2. The contents of the car tank should only be unloaded during daylight hours or when adequate lighting is provided.
3. Ample water should be available at the unloading site. This should include a shower equipped with a quick-opening, deluge head, and an eyewash fountain.
4. If the unloading area has heavy traffic it should be roped off and passersby warned by posting of "Danger—TDI" signs.

Top Unloading of TDI

This is the only method possible for most cars, and the preferred method for all cars. Figure 7 shows how unloading is accomplished by using an inert gas such as nitrogen or dry air (-40°C dew point). This dry atmosphere padding is necessary in order to prevent a reaction between the TDI and any water vapor which might be present. Under no circumstances should a combustible gas be used; it presents an explosion hazard.

All fittings should be inspected for evidence of potential leaks before the tank and piping system are pressurized. An oil trap should be installed on the inert gas supply line.

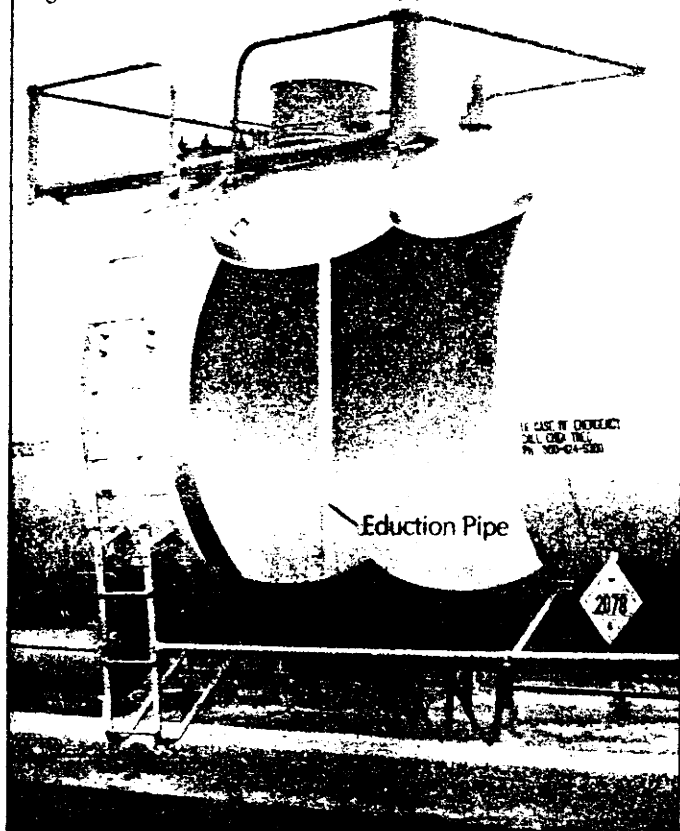
Tank cars are protected by a safety valve. The pressuring system should be designed so as not to exceed a safe working pressure. Thirty psig is suggested as a maximum, regardless of the capacity of the tank car. Lower pressures are desirable and 10-20 psig is recommended.

The preliminary steps of positioning the car and installing the necessary safety devices must be carried out in accordance with the instructions outlined in the *Tank Car Unloading* sub-section, above.

Before unloading, check the temperature of the TDI and take a sample. Then:

1. Secure the tank car manway if it has been opened. Make sure the storage tank is adequately vented.
2. Remove the 1-inch plug from the inlet valve and connect the inert gas line (see Figures 5 and 8).
3. Check the unloading line for proper temperature of $21-30^{\circ}\text{C}$ ($70-86^{\circ}\text{F}$). Preheat the line if necessary, and connect it to the eduction pipe.

Figure 6. Sectional View of Tank Car



4. Open all valves in the unloading line.
5. Open the inert gas supply valve. The pressure on the car will effectively be established by the setting of the inert gas valve. The flow of TDI can be controlled by a valve in the unloading line.

After unloading is complete:

1. Clear the unloading line and equalize the line pressure. Disconnect the unloading line and cap it.
2. Disconnect the steam lines and blow out the coil with inert gas. Do not replace the caps on the steam line.
3. Repressurize the car to 10 psig with nitrogen.
4. Secure the dome housing.
5. Reverse all four placards and return the car by prescribed routing.

Bottom Unloading of TDI

Olin strongly advises against bottom unloading TDI and, in fact, bottom unloading is impossible on most Olin cars. However, if cars must be bottom unloaded, contact Olin Technical Service for suggested procedures.

Cars which can be unloaded from the bottom come in two types: those with a 4-inch exterior ball valve, and those which have an internal foot valve. Most cars also have a 2-inch reducer auxiliary ball valve.

Cars with an internal foot valve can be identified by the combination valve handle/cover on the top of the car. In order to open the valve the cone-shaped cover must be removed, inverted and reattached. To open, rotate counter-clockwise.

When finished, close the valve, invert the cover and replace in its original position. This cover cannot be replaced unless the valve has first been closed.

Unloading Tank Trucks

Tank trucks are unloaded by the driver of the vehicle. He is responsible for following proper safety rules. However, it is the recipient's responsibility to provide competent supervision and safety equipment. The supervisor should make sure the unloading area is clear and adequate facilities are ready for receiving the shipment. The unloading area should be level and paved so the truck can be easily maneuvered to the proper spot.

On tank trucks used for short hauls insulation is not necessary. However, insulated trucks are often used to maintain proper temperature, particularly for longer hauls or colder weather.

The arrival temperature of the TDI must be above 21°C (70°F). If the temperature is below 21°C it is the trucking company's responsibility to correct it.

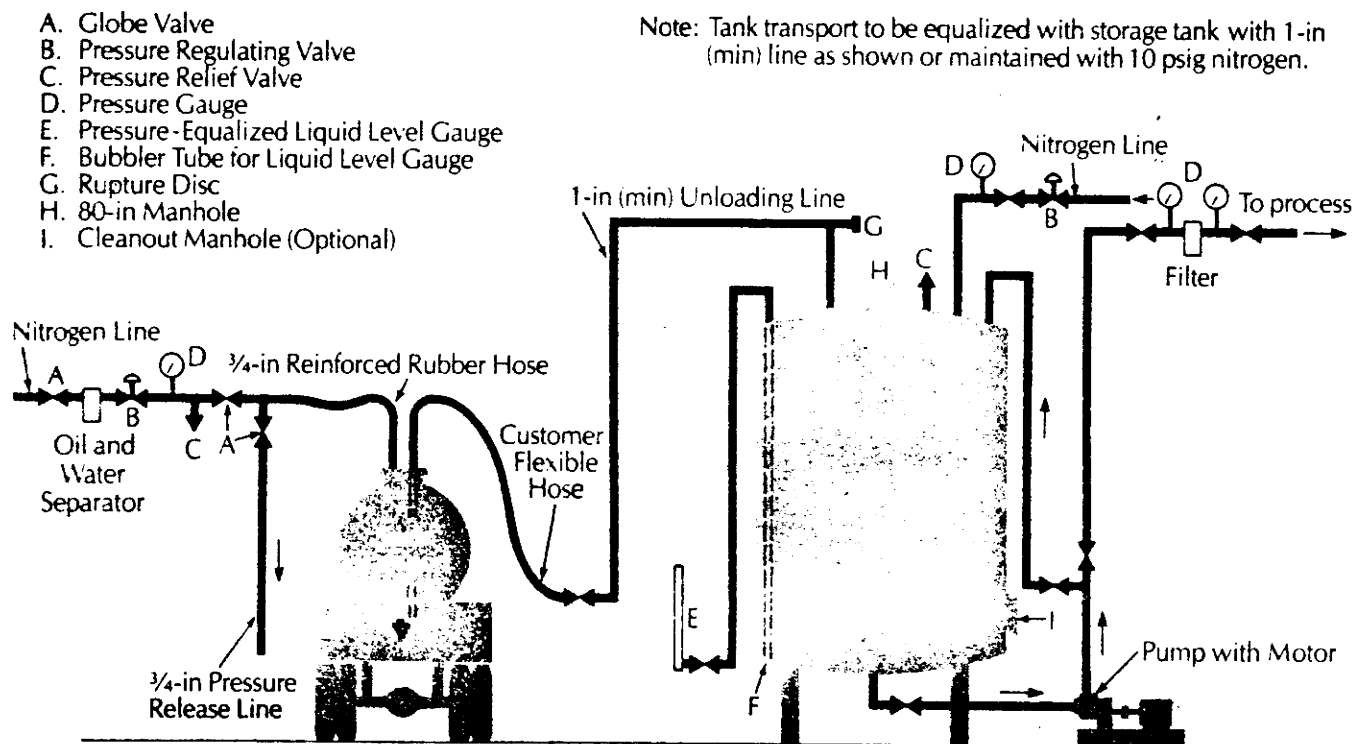
After the temperature has been checked (and adjusted, if necessary) a sample of the shipment should be taken. Tank trucks are equipped with a sampling tube for this purpose.

Unloading Drums

Follow all applicable safety procedures. Be sure full protective clothing is worn when opening the drum plug (bung), when placing or operating pumps, or when flushing out empty drums. In the event of spillage, see page 12.

If the TDI is frozen, or if there is a possibility of freezing

Figure 7. Top Unloading and Storage Arrangement



because drums have been exposed to ambient temperatures below 17°C (62°F), then the drum should be heated to 35-40°C (95-105°F) until all TDI is liquid. Heating above 40°C should be avoided. After being thawed, the drums should be rolled for at least 30 minutes to uniformly mix the 2,4- and 2,6-isomers.

Drums should be kept under a nitrogen or dry air (-40°C dew point) to prevent contamination by water vapor. However, unloading by pressure is unsafe. The preferred method is by pump—manual or electric (see Figure 9). If the pump is electrical be sure the drum is properly grounded. If drums are to be emptied by gravity the faucets should be self-closing. Bung holes should be fitted with a dryer-breather vent device to prevent drum collapse.

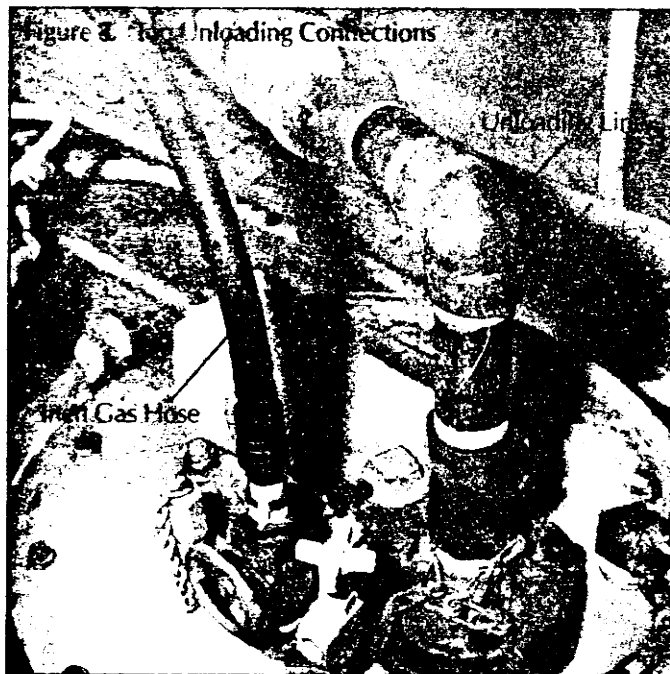
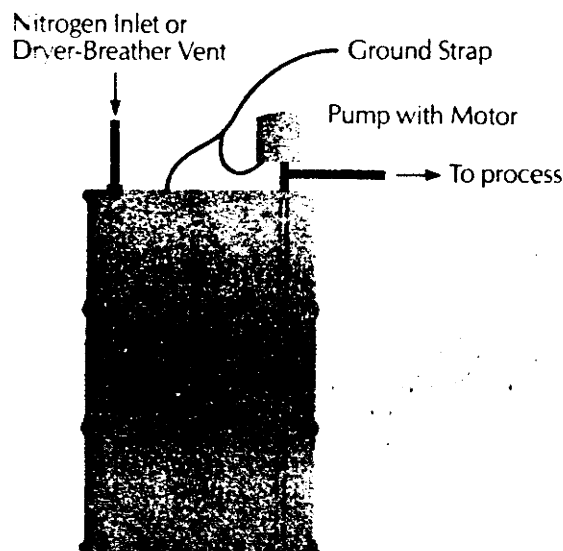


Figure 9. Drum Unloading System



THAWING TDI TANK CARS

TDI is shipped in insulated tank cars. During the winter it is loaded at temperatures between 38 and 43°C (100-110°F). Despite these precautions there may be substantial heat loss before the car reaches its final destination.

Therefore, during the winter all incoming tank cars of TDI should be checked for freezing.

The 2,4-isomer of TDI-80 freezes at 15°C (59°F); the 2,6-isomer at 7.2°C (45°F). Between these two temperatures only the 2,4-isomer freezes. If this happens isomer stratification takes place. However, if proper care is taken in thawing TDI, the quality can be maintained and no foaming problems should occur.

How to Determine if TDI is Frozen

There are two ways to tell if freezing has taken place: (1) visual inspection of the car's contents and (2) measuring TDI temperature. Temperature measurement is the preferred method because it is more accurate and will detect frozen TDI even when it is not visible.

Temperature measurement. Some tank cars contain a stainless steel thermowell under the dome cover. Simply insert a thermocouple into the thermowell and read the temperature.

If the temperature is less than 17°C (62°F) it is likely that the car contains some frozen TDI.

With cars which do not contain a thermowell, a thermometer must be inserted into the tank car. A self-contained breathing apparatus should be worn as protection from TDI fumes.

Release the pressure from the car by opening the one-inch pressure release valve. A thermometer can then be inserted through this ball valve. Or, the dome can be opened and the thermometer inserted through the dome. The thermometer should be lowered to the bottom of the car, then slowly removed.

When taking the temperature, use a Min/Max^a thermometer. A conventional thermometer may give an erroneous reading because the ambient temperature is usually lower than the internal TDI temperature.

Visual inspection. Release the pressure on the car by opening the one-inch air release valve, then open the dome. A self-contained breathing apparatus should be worn as protection from TDI fumes.

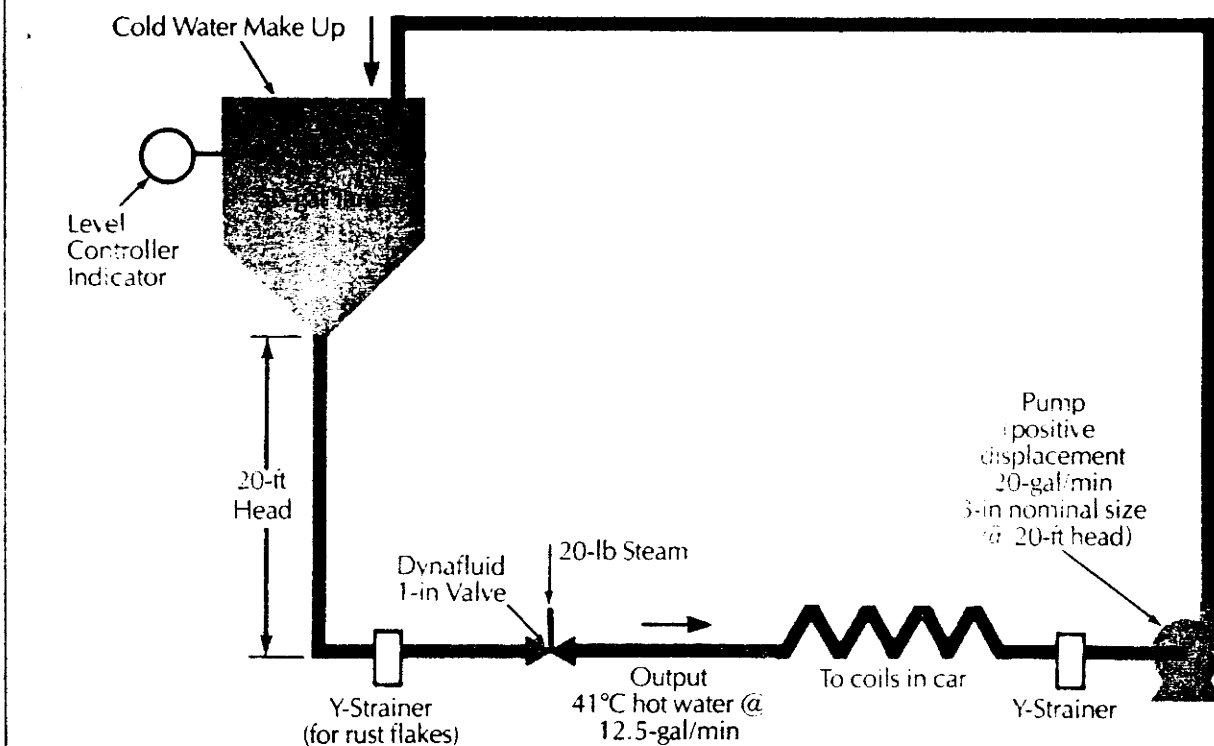
By looking inside the tank car it is frequently possible to detect the presence of frozen TDI. When frozen, TDI is an opaque white solid. It usually forms on the tank car walls, bottom valve areas and on the two-inch reduction tubes. Since it is often difficult to see frozen TDI in these locations the contents may be frozen, though no white solids are visible to the inspector. It is for this reason Olin recommends the car temperature be measured, by the methods described above.

When to Heat a TDI Tank Car

If the TDI temperature is less than 17°C (62°F), or if frozen TDI is detected visually, the car should be heated before it is unloaded.

^aFisher Scientific, Catalog #15-09.

Figure 10. Steam/Water Mixing System



If the car is not to be immediately heated or unloaded, it should be repressurized to 25 psig with nitrogen or dry air (-40°C dew point). Otherwise polyurea may form as the result of contamination of the TDI with water.

Heating a TDI Tank Car

The TDI should be heated to 32°C (90°F) until all the frozen TDI has thawed. Never allow the TDI temperature to exceed 43°C (110°F). If TDI is overheated dimerization takes place (see page 2). If this occurs the product should not be used.

Heat sources. The best way to thaw frozen TDI is with tempered hot water, thermostatically controlled to 41°C (105°F). Hot water is less likely than steam to cause dimerization.

If tempered hot water is not available, an alternate source

of heat is 20-lb steam, mixed with cold water. A steam/water mixing system similar to the one shown in Fig. 10 can be used to obtain the desired temperature.

Plants that have only steam available should avoid pressures above 20 lbs. High pressure steam, if not watched very carefully, will rapidly overheat the TDI. Even at lower pressures, careful monitoring must take place.

Heat source connections. Olin has a mixed fleet of tank cars that were designed by different tank car manufacturers and put into service at different times. Therefore, cars must be carefully examined to determine the size and location of the external coil inlets and outlets.

In general, the inlet is on one side of the car away from the handbrake (Fig. 11). If there are two inlet valves, the one farthest away from the handbrake side is for the left side coils; the one nearest the handbrake side is for the right coils.

Cars with a bottom outlet valve may have a separate inlet and outlet coil around this valve. If they must be used, they should be hooked up separately. When thawing bottom valves, take care not to damage the valve seats or to form dimer in and around the ball. This could prevent the valves from opening.

After the TDI is Thawed

After the TDI has been heated to 27°C , the entire contents of the car must be mixed to eliminate isomer ratio separation. There are two ways to mix the car's contents thoroughly.

First is to have the railroad move the car around for about two hours. Second is to unload the entire contents into a bulk storage tank. The TDI should then be recirculated for two to three hours.



STORAGE OF TDI

Toluene diisocyanate may be stored indoors or outdoors. If TDI is stored indoors, the building should have sprinklers, good ventilation and adequate heat to maintain storage temperature of 21°C (70°F). Constant monitoring of TDI temperature is required.

If TDI is stored outdoors, or if indoor temperatures may drop below 21°C, provisions must be made for warming and thawing the TDI. These include adequate tank and line insulation, external heating coils or jackets, and steam-traced or electrically heated lines.

If thawing is necessary, never heat the TDI above 43°C (110°F). Overheating will cause dimer formation (see page 2). After thawing, mix the TDI to eliminate isomer separation. Use a tank agitator or a pump (recycle from top to bottom).

Whether indoors or outdoors, bulk storage tanks should be blanketed with nitrogen. Without this dry atmosphere, water vapor will react with the TDI to form solid polyurea which can plug lines and foam machine heads.

A pneumatic bubbler gauge^a that operates with nitrogen is recommended. This gauge measures the pressure required to displace TDI from a vertical tube in the tank.

Storage Tank Design

Vertical, cylindrical steel tanks are normally preferred for storing TDI, although limited indoor headroom may dictate the use of horizontal tanks.

Vertical tanks use minimum ground space. This means less surface area is exposed to cold weather, and problems relating to heating and insulating are minimized. Vertical cylindrical tanks have a uniform cross section, and are gauged more readily than are horizontal tanks.

Storage tanks may be field-erected on a concrete foundation and there is no practical limitation to size. Recommended capacity is 30,000 gallons for tank car deliveries and 6-8,000 gallons for tank trucks. In other words, capacity should be sufficient to accept the entire contents of a tank car or truck even when half-filled.

Materials of Construction

TDI tanks can be made from carbon steel (ASTM A 285 Grade C) or from stainless steel (Type 304 or 316). API Code 650 specifies 1/4" steel for the bottom; 3/16" for the shell and roof. Stainless steel tanks require no lining. Carbon steel tanks should have a baked phenolic lining. Recommended are: Heresite P 403^b, Lithcote LC 73^c, or Amercote 75^d. The inside surface should be sandblasted to a commercial finish and cleaned prior to the application of the lining.

Hose and Piping to Receive TDI

From tank trucks. TDI is discharged by a built-in pump on the truck through flexible hose provided by the trucker into piping supplied by the customer. The length of the hose is specified by the customer with his first order. The piping should be Schedule 40 steel, or Aluminum Alloy 3003.

From tank cars. TDI is discharged through flexible hose into piping to the storage tank. Both the hose and the piping

are provided by the customer. The hose should be lined with butyl rubber or non-virgin TFE (for piping materials, see above).

For bottom unloading of TDI, a positive displacement or centrifugal pump of adequate capacity is required. The pump should be made of alloy 20 or stainless steel with welded parts. Mechanical seals should be of the same materials with O-rings of butyl rubber or non-virgin TFE.

When top unloading, it is also necessary to pressurize the car. Pressure should be 10-20 psig nitrogen or dry air, through a 3/4-in reinforced rubber hose attached to the 1-in gas inlet quick disconnect. An oil and water separator and pressure regulator are also suggested as an assembly in the line near the fitting for the quick disconnect attachment.

Auxiliary Equipment

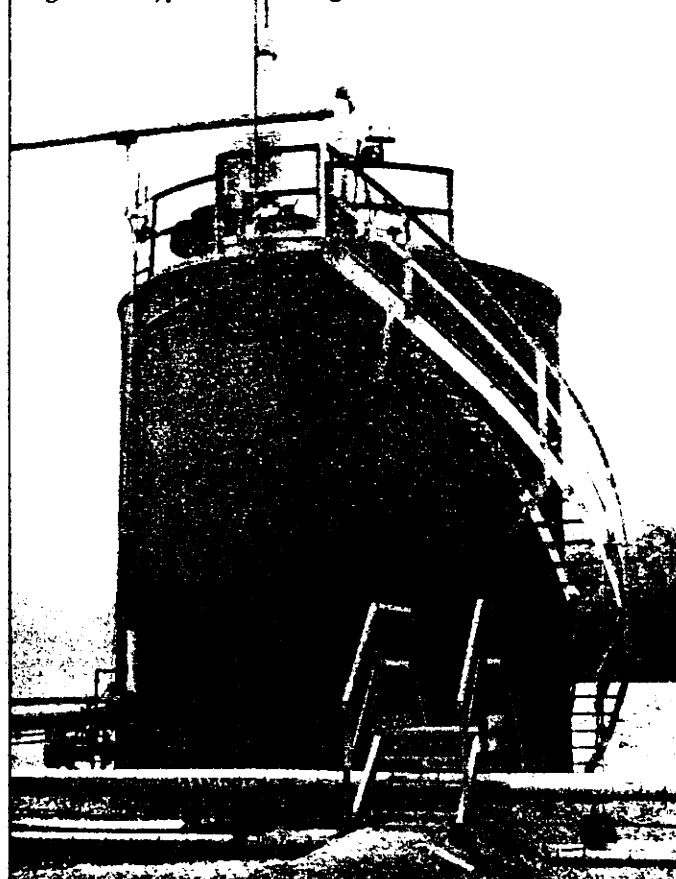
Valves. Ball valves should be stainless steel with non-virgin TFE seals. Plug valves should be stainless steel or alloy 30, with non-virgin TFE sleeve. Valves may be threaded or they may be flanged (150-lb ASA or MSS).

Filter and pressure gauges. A filter should be placed in the piping between the tank car or tank truck and the storage tank. A cartridge filter with 20- or 30-micron glass fiber element is recommended.

Pressure gauges should be installed on either side of the filter to measure the drop. This will indicate when the filter must be cleaned or replaced.

Sampling valves. If delivery is by tank car an in-line sampling valve is recommended (see page 4).

Figure 12. Typical TDI Storage Tank



^aPetrometer Corp., New Hyde Park, NY, or Varec Div., Emerson Electric Co., Garden Grove, CA

^bHeresite and Chemical Company, Manitowish, WI

^cLithcote Corporation, Cherry Hill, NJ

^dAmercon Corporation, Altoona, PA

HANDLING TDI

Toluene diisocyanate is a toxic and highly reactive compound. It should be kept in closed, isolated systems and transferred with care. However, TDI is not a difficult material to handle. If proper procedures are followed there is relatively little chance of danger.

The following sections briefly discuss some possible hazards and describe what to do in an emergency. Plant personnel should be thoroughly familiar with these procedures.

Reactivity Hazards

TDI is a stable compound with a relatively high flash point. However, it will react with water, acids, bases, and other organic and inorganic chemicals. TDI is also affected by heat and, like any organic compound, will burn.

Water. When TDI comes in contact with water, aromatic poly-substituted ureas are formed, heat is generated and carbon dioxide is evolved. Pressure build-up from the carbon dioxide will occur. This pressure could rupture a storage vessel.

To help prevent reaction with water the TDI should be kept under a nitrogen or dry air (-40°C dew point) pad.

Chemicals. TDI is a base and contact with acids should be avoided. Contact with bases, such as caustic soda, tertiary amines, etc., might cause uncontrollable polymerization. The heat given off could then rapidly vaporize solvent that might be present, again causing pressure build-up and risk of rupture of the storage vessel. High temperatures may also cause dimerization.

TDI should be kept away from rubber and plastics. These materials will rapidly become embrittled, cracks may develop and their strength may be weakened.

Fire Hazards

The flash point of TDI is 132°C (270°F) and therefore does not constitute a severe fire hazard. However, it should be remembered that TDI is an organic material and will burn when exposed to fire. In addition, the flash point of TDI does not reflect the hazards presented by any cellular or foam plastic product which contains TDI.

Health Hazards

TDI can be dangerous to health in either its vapor or liquid forms. Exposure to TDI vapor should not exceed 0.02 ppm at any time. However, it is difficult to detect TDI by its odor until it has reached 0.4 ppm. In other words, if TDI can be smelled, there is already too much vapor present. Therefore an OSHA- or NIOSH-approved TDI monitor should be used.

Some people develop an acute sensitivity, even at very low concentration. For this reason, pre-employment physical examinations should exclude persons with chronically recurring pulmonary disease or allergic history.

Inhalation. TDI is toxic from inhalation exposure. If inhaled, it may cause difficulty in breathing and irritation or injury to the lungs. Inhalation may also produce allergic sensitization to the respiratory tract.

Safeguards against inhalation include adequate ventilation, detection devices and respirators. The respirator (self-contained or air-line type) should only be worn temporarily while adequate ventilation is being reestablished.

Dermal and oral exposure. Toxicity from dermal or oral exposure is low. The acute oral LD_{50} (rats) is approximately 5.7 g/kg. However, TDI is irritating to the skin, eyes and mucous membranes, and may cause burns if not removed rapidly. Protective clothing, including goggles, should be worn whenever there is a likelihood of contact with TDI (see Figure 13).

Ingestion of TDI can cause severe irritation of the gastrointestinal tract. TDI should be stored away from foodstuffs. And food should not be eaten where TDI might be present.

Protective Clothing

Because of the health hazards associated with TDI, full protective clothing and equipment should be worn wherever there is a possibility of contact. Such occasions include (but are not limited to):

- When opening tank car hatches, truck manway covers or drum plugs
- When connecting and disconnecting hoses and pipes
- When placing and operating pumps
- When breaking TDI piping, even if previously decontaminated
- When flushing out drums

At other times, outer clothing made of cotton or a suitable synthetic fiber — plus a rubber apron for extra protection — should be worn.

If any article of clothing should be contaminated, remove it immediately and discard properly (contact with TDI damages both natural and synthetic fibers).

What To Do In Case Of . . .

White precipitates. There are three causes of white precipitates in TDI: dimer (caused by excessive heat), polyurea (caused by the presence of water), or frozen TDI. If it is not obvious which of the three is present, then heat the crystals. If they melt at $16-21^{\circ}\text{C}$ ($60-70^{\circ}\text{F}$) they are frozen TDI. If they melt at $150-160^{\circ}\text{C}$ ($302-320^{\circ}\text{F}$) then they are dimer. If they do not melt they are polyurea.

If the crystals are frozen TDI then the TDI can be thawed; remixed and used. If the crystals are polyurea then they can be filtered out and the remainder of the TDI can be used. However if the crystals are dimer then they cannot be completely removed (dimer reforms on filtration). The TDI should not be used because the dimer will affect physical properties as well as clog lines and foam heads. If dimer is present, contact Olin.

Discoloration. Normal TDI is water-white to light straw in color. If the color is darker than this the TDI has been exposed to light or high temperature. If the color is something other than water-white or yellow then the TDI has been contaminated and should not be used; call Olin for assistance.

If the TDI color has darkened, assume it has been caused by high temperature (the chances of light-induced discoloration are negligible). Since high temperature may also cause dimer formation the TDI should be tested. Simply cool a sample to room temperature. If white crystals precipitate, then dimer is present and the TDI should not be used. If there are no white crystals present then the TDI may be used. The discoloration will not affect physical properties or foam color.

Figure 11. Protective Clothing and Equipment



Protective Clothing and Equipment

Protective Clothing and Equipment

Protective Face Shield.
Worn if there is
possibility of
splashing material on the face.

Protective Clothing.
Should be well contained
and should be worn only
if temporary measure
and adequate ventilation
is established.

Protective Boots.
Should have safety toes.
Rubber overshoes
may be worn with
ordinary work boots.
Do not wear uncovered
leather shoes.

EMERGENCY ACTIONS

The following section contains basic information on what to do in the event of an accident. If additional information is necessary, call the Olin Product Emergency Service (OPES). Speedy advice from experts can be received 24 hours a day by calling:

(203) 356-2345

You will be asked to give a brief description of the emergency and leave your name and phone number. Shortly after, you will receive a return call from someone experienced with TDI who will advise you of immediate action to be taken.

In addition, the Chemical Manufacturers Association has established CHEMTREC to give advice on spill, leak or fire emergencies involving transportation and transport equipment. The CHEMTREC number is:

(800) 424-9300

In the District of Columbia, call 438-7616. If calling from Canada, dial (202) 483-7616.

First Aid

If there is known contact with toluene diisocyanate, take the following steps:

Eye or skin contact: Flush thoroughly with water. Call a physician.

Inhalation: Remove victim to fresh air. Call a physician.

Ingestion: Wash out mouth with water. Give plenty of water to drink, but do not induce vomiting. Call a physician.

Some symptoms of overexposure to TDI vapors include tightness in the chest, watering eyes, dry throat, and headaches. These symptoms may not appear until several hours after initial exposure. If there has been the possibility of exposure, and if these symptoms do appear, a physician should be called.

Handling Spills & Leaks

The National Institute of Occupational Safety and Health (NIOSH) publishes *Criteria for a Recommended Standard . . . Occupational Exposure to Toluene Diisocyanate*. In it, the

following procedures are suggested:

When TDI leaks, or spills occur, only properly protected personnel should remain in the area. Leaking containers should be removed to the outdoors or to an isolated, well-ventilated area, and the contents transferred to other suitable containers. [See "Leaking Drums", below.]

Adequate preparation and facilities for handling spills should be provided. These include suitable floor drainage and ready accessibility of hoses, mops, buckets, and absorbent materials. Spills should be cleaned up promptly.

The effectiveness of water is considerably improved by the addition of 1-5% ammonia. This solution is further improved by the addition of up to 10% isopropyl alcohol. [In cold weather, Olin recommends using a 50-50% mixture of isopropyl alcohol and perchloroethylene.]

Other absorbent materials such as sawdust or vermiculite are also useful in facilitating clean-up of spills. Such materials, after use, should be shovelled into an open-top steel container, the container then covered and removed to a safe disposal area away from the operating area.

The mixture should be soaked with water containing ammonia and allowed to stand for 24 hours in an open or partially open container.

Only after all the TDI has been neutralized should the container be sealed and disposed of according to appropriate Federal, state and local regulations.

Leaking Drums

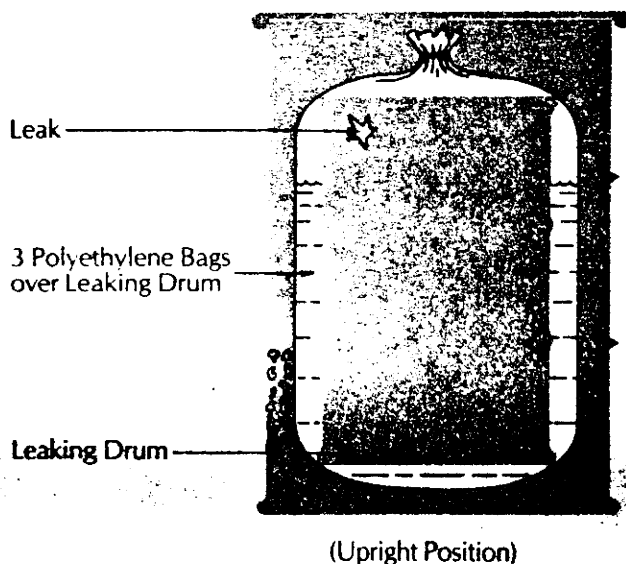
Invert the drum to stop the leak. The spilled TDI should be disposed of as described above. Then call Olin Technical Services:

(203) 789-6073 (8:30 AM-4:30 PM, Eastern Time)

(203) 356-2345 (all other times)

A 65-gallon salvage drum (Figure 14) will be sent to you. The original drum should be packed in a polyethylene bag within the overpack drum, marked "toluene diisocyanate UN2078," labeled "poison" and then returned to Olin.

Figure 14. Salvage Drum



U.S. Sales Offices

Atlanta, GA 30328
1140 Hammond Drive,
Suite 6150
(404) 394-5820

Charlotte, NC 28280
1 NCNB Plaza, Suite 3505
(704) 373-1681

Cincinnati, OH 45242
8150 Corporate Park, Suite 210
(513) 489-7990

Houston, TX 77027
4550 Post Oak Place Dr.,
Suite 220
(713) 960-0610

Oak Brook, IL 60521
2301 West 22nd St., Suite 209
(312) 325-2280

Orange, CA 92668
500 S. Main St., Suite 910,
North Tower
(714) 558-9101

St. Louis, MO 63105
7777 Bonhomme Ave.,
Suite 1908
(314) 862-6705

Stamford, CT 06901
3 Landmark Square,
Suite 205
(203) 356-3000

Wayne, PA 19087
997 Old Eagle School Road,
Suite 208
(215) 293-0990

International Sales Offices

Australia
Olin Chemicals Pty., Limited
1-3 Atchison Street
P.O. Box 141
St. Leonards 2065, N.S.W.,
Australia
Phone: (612) 439-6222
Telex: 26328

Brazil
Olin Brasil Limetada
Rua Galeno de Castro, 165
Jurubatuba-Santo Amaro
04696 Sao Paulo, Brazil
Phone: (5511) 548-7566
Telex: 11-25034

France
Olin Europe, S.A.
Chemicals Division
90 Avenue des Champs Elysees
75008 Paris, France
Phone: (331) 562-32-10
Telex: 650769

Germany
Olin Chemicals GmbH
Grafenberger Allee 66
4 Düsseldorf, Germany
Phone: (49211) 675045
Telex: 8586646

Ireland

Olin Chemicals B.V.
Swords
County Dublin, Ireland
Phone: (3531) 402-411
Telex: 30973

Japan

Olin Japan, Inc.
Shiozaki Building
7-1 Hirakawa-Cho 2-chome
Chiyoda-ku
Tokyo 102, Japan
Phone: (813) 263-4615/7
Telex: 023-24031

Mexico

Olin Quimica, S.A. de C.V.
Campos Eliseos No. 385
Piso 9, Torre A
Col. Polanco
Delg. Miguel Hidalgo
11560 Mexico, D.F., Mexico
Phone: (905) 540-38-83
Telex: 017-74-578

Singapore

Olin PTE Ltd.,
11 West Coast Road
Singapore 5
Phone: (65) 776-2034
Telex: RS 35441

South Africa

Lion Chemicals (Pty.) Limited
Old Mutual Centre, 7th Floor
Corner Kerk & Harrison Sts.
P.O. Box 61436
Marshalltown 2107
Johannesburg, South Africa
Phone: (2711) 838-5782
Telex: 8-6655

Spain

Olin Iberica, S.A.
Av. Alberto Alcocer 7
Madrid 16, Spain
Phone: (341) 250-85-02

United Kingdom

Olin U.K. Limited
42 High Street
Guildford
Surrey, England
Phone: (44483) 64726
Telex: 859391

United States

Olin Chemicals
120 Long Ridge Road
Stamford, CT 06904
U.S.A.
Phone: (203) 356-2380
Telex: 420202

Venezuela

Olin Quimica, S.A.
Galipan Bldg., Piso 2,
Entrance C
Av. Francisco Miranda
Apartado 3781, Chacao
Caracas, Venezuela
Phone: (582) 32-32-38
Telex: 26553

A word about Olin Corporation

Olin ranks high in Fortune Magazine's directory of leading U.S. industrial companies. It has sales of \$2 billion, over 20,000 employees, 37 plants in 23 states and 16 manufacturing operations in 10 foreign countries.

But we're more than just numbers, and we'd like you to understand us better. You know of Olin Chemicals. And though you may not realize it, you've probably met our other five operating groups — Consumer, Brass, Ecusta Paper and Film, Winchester and Olin-American, through some of the things they make or do. For example:

Our Consumer Group makes Omalon® carpet foundation, Olin® skis, and signal flares, plus HTH® and Pace® swimming pool sanitizing chemicals. HTH is the largest-selling brand of pool water sanitizer in the world.

Our Brass Group produces brass, bronze and copper sheet and strip. It is the largest supplier of coin material to the U.S. Mint.

Our Ecusta Paper and Film Group is a major producer of cigarette papers, and one of only two U.S. suppliers of cellophane.

Our Winchester Group makes world-famous Winchester Western® sporting ammunition, as well as ammunition for national defense.

Olin-American is our real estate subsidiary, building homes and commu-

nity developments across the nation.

In addition, Olin produces Ramset® powder-actuated tools, Weaver® scopes for sporting arms and proprietary seeds.

The Olin Chemicals Group

Taken alone, this Group could well be a major U.S. corporation. In 1981 Olin's sales of chemical products exceeded \$1 billion.

Olin is a major producer of commodity inorganic chemicals. In fact, of the eleven chemicals most widely used in industry, Olin makes nine.

Olin also produces more specialized organic and inorganic chemicals. We're a leader in sodium phosphates, fluorides and chlorite used for treating industrial and municipal water supplies. Olin is the only U.S. manufacturer of synthetic sodium nitrate and sodium chlorite. We're the largest U.S. producer of ring-fluorinated aromatic derivatives.

We're the nation's largest marketer of hydrazine, the propellant that put our lander on the moon, and is helping to make the space shuttle a reality. On earth, hydrazine and its derivatives have important though less esoteric uses, like keeping industrial boilers from rusting, making soap more slippery, and protecting crops from weeds.

Olin is one of the largest marketers of ethylene and propylene glycol ethers in

the U.S. They're used in such diverse products as solvents, paints, household cleaners, insecticides and functional fluids.

You'll find our products on the farm. Our ammonia and urea go into fertilizers that help raise crops. Our Terraclor® and Terrazole® fungicides protect them during growth.

You'll find our products in the home. Olin urethanes go into upholstered furniture and refrigerator insulation. Our blowing agents are used to make vinyl flooring. Your shampoo may contain our Omadine® antimicrobial agent, the active ingredient in most anti-dandruff shampoos throughout the world. Your household detergents may contain our sodium phosphates and Poly-Tergent® surfactants.

You'll find our products used in your clothes. Our Reductone® sodium hydrosulfite and Dyetone® sodium bromate are basic chemicals for textile dyeing. And we supply key intermediates for dyestuffs.

You'll find our products in your car. Olin is one of three primary manufacturers of brake fluid in the U.S. And Olin urethane chemicals are used to make everything from seat cushions to impact-resistant bumper systems.

In fact, wherever you live, however you travel, whatever you do, chances are your life is touched in some way by the chemical products made by Olin.

This bulletin and the information contained herein are offered solely for your consideration, investigation and verification. No representations or warranties, express or implied, of merchantability or otherwise, are made or contained herein. Olin's responsibility for any claims arising in connection herewith shall in no event exceed the purchase price or fair market value of the material. User accepts full responsibility for compliance with all applicable Federal, state and local laws and regulations. Nothing contained herein shall be construed to constitute permission or a recommendation to practice any invention covered by a patent or patent application or know-how owned by Olin Corporation or by others.

Olin CHEMICALS
120 Long Ridge Road, Stamford, Connecticut 06904



FLUOROCARBON

27611 La Paz Road
P.O. Box 6299
Laguna Niguel, California 92656

Document Processing Center
Office of Toxic Substances, TS-790
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460

Attention: CAIR Reporting Office

CERTIFIED/RETURN RECEIPT REQUESTED

PRESORTED
FIRST CLASS



Fold at line over top of envelope to the right
of the return address.

CERTIFIED

P 178 427 660

MAIL